FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World
Founder and Editor: STANLEY SPOONER
A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport
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DIARY OF FORTHCOMING EVENTS.

Club Secretaries and others desirous of announcing the date of important fixtures are invited to send particulars for inclusion in the following list:

April 18 to May 2	Seaplane Competition at Monaco
April 21 ...	Lecture on "The Commercial Future of Airships," by Air-Commdr. Edward Maitland, C.M.G., D.S.O., A.F.C., at Royal Society of Arts, John Street, Adelphi, at 4.30 p.m.
May 22 and 23	Aviation Competition at Juvisy in connection with Fêtes de Paris
June 1 ...	Air Ministry Competition (Small Type Aeroplanes), Martlesham Heath
July ...	S.B.A.C. International Aero Exhibition at Olympia
July (mid.)	Seaplane Contests at Antwerp
Aug. 1 ...	Air Ministry Competition (Seaplanes), Felixstowe
Aug. (end of)	Schneider International Race, Venice.
Sept. 1 ...	Air Ministry Competition (Large Type Aeroplanes), Martlesham Heath
Sept. ...	International aviation week (with competitions) at Brescia, Italy
Sept. 27 to Oct. 3	Gordon-Bennett Aviation Cup, France

EDITORIAL COMMENT

ACCORDING to the political correspondent of the *Daily Mail*, the Cabinet is giving "fresh consideration to the demand for the re-creation of the Air Council as a separate Ministry, thus removing it from the direct control of the War Office." It is believed, he says, that the Cabinet will shortly accede to the demand.

To Preserve the Air Ministry

In that case, it is good to know that the Cabinet has been brought to realise that the present position is anomalous and impossible from every point of view. It is against all efficiency in the case of the Air Service, and makes what was expressly constituted a separate Service by the authority of Parliament, into a mere appenage of the War Office. While we have every admiration for the brilliant attainments of the present War Minister, and fully recognise the splendid services he has rendered to aviation in the past, we cannot pretend to the smallest satisfaction with his administration of the Air Ministry while he has occupied the plural *rôle* of Secretary of State for both War and Air. It is idle to argue that he has not been biassed by the advice given by the experts of the War Office. It is quite notorious within the Air Ministry that he has been War Minister first and Air Minister a long second. He could have been nothing else—unless, possibly, he were a super-man of the type made familiar by certain of the new departments of State which have sprung into existence as a result of the necessity for finding jobs for people who had rendered more or less service to the nation, well behind the danger zone. Mr. Churchill is not of these, and being merely human, is as prone as anyone to adopt the point of view of those who have his principal ear, so to say. Therefore, the arrangement has not worked well, and it is simply not true to say that he has given satisfaction as Air Minister. Even if he had, we should still remain unconvinced of the benefits to be gained from placing two departments, which are to some extent antagonistic in their interests, under a single head. We trust that the Cabinet will lose no time in making up its collective mind that the anomaly must disappear and will proceed at once to put its resolution into effect. There is no suggestion

yet as to who is likely to succeed Mr. Churchill at the Air Ministry. It is hardly probable that he will elect to stay in Kingsway and give up the War Office. If we mistake not, although he has been a good friend to the Air, his real interests lie more with the Army, and he would require a great deal of persuasion to lead him to sacrifice the portfolio of War. There *are* good men available, and it remains with the Government to make a selection such as will lead to a reversal of the present disastrous neglect, to the undoing of the whole industry in the present, and ultimately of the Empire's safety.

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Mr. Holt Thomas' Position

It was reported last week that Mr. Holt Thomas, whose resignation of the chairmanship of the Aircraft Manufacturing Company we announced and commented upon in our Editorial columns, had been asked to resume that position, and had consented. We have enquired into the truth of the report, and are assured that the position remains exactly as it was. The only change which has been made in the arrangements since his resignation is that the Paris air mail is to be carried on in future under B.S.A. auspices.

Even this latter concession is something these days to be thankful for, and it may be that out of evil good may come. Mr. Holt Thomas as a free lance may perhaps become a greater power for good in the movement at large than Mr. Holt Thomas as chairman of a company actively engaged in the industry, in which he might—quite properly—be supposed to have an axe of his own to grind when urging the Government to get a move on in the matter of encouraging civil aviation. Mr. Holt Thomas is the best judge of his own business, but upon consideration, we venture to think that he may easily be a greater asset outside the active industry than in it, for the reason that outside he can bring to bear the whole force of his personality upon the problems of propaganda. We suggest that he could do very few more apt things than to take in hand the Aerial League and make it a real factor in the world of aviation. Something of the kind is very badly needed, since only by insistent and well-directed propaganda shall we get public opinion focussed upon the vital importance of keeping the lead in air power. What the League badly wants is a dominant personality, who will supply the driving force which has been so conspicuously wanting in its affairs, and who will make it what the Navy League is in the matter of the Fleet. We mean no personal disparagement towards those who have done, and are doing, their best to foster the League, but there is no good end to be gained by refusing to look facts in the face.

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Air Survey of the Kingdom

Viscount Curzon recently asked the Under-Secretary for Air if any steps have been taken, or are in contemplation, to make an aerial photographic survey of the whole, or, at any rate, the more important parts of the United Kingdom. Sir A. Griffiths-Boscawen, in reply, said the United Kingdom was the most completely and accurately mapped country in the world, on all scales ranging from 25 inches to the mile to one mile to the inch, and smaller scales, and these were periodically revised. The Ordnance Survey were watching the development of aerial photography, but at present that method was far less accurate and more expensive than those now adopted. Future possibilities were, however, not being lost sight of.

While we fully appreciate that aerial survey is an expensive process, we are inclined to regard it as necessary that at least the more important areas should be subjected to aerial survey. If in the near future civil aviation is to develop at all along anticipated lines, it will be quite essential that there shall exist a complete and accurate scheme of charts for the aerial navigator. In the light of present knowledge, it is quite possible that the aerial survey cannot compete in accuracy with the meticulously-careful and scientific methods of the Ordnance Survey, which have been perfected over a period measured almost in hundreds of years. It is not necessary, however, that aerial maps should have the same exactitude as Admiralty charts, for example. What is required is a photographic survey which will enable the aerial navigator to fix his position within a few miles and to pick up landmarks with certainty. The maps we already have in existence are certainly good, and achieve this purpose within their limitations, but they do not pretend to the excellence of the photographic survey. It would be asking too much, perhaps, with the nation's finances in the state they are, to demand that a complete survey should be undertaken forthwith, but we certainly think there is a good case made out for a more limited survey on the lines suggested by Viscount Curzon. And this might be both under summer conditions and under bare boughs conditions.

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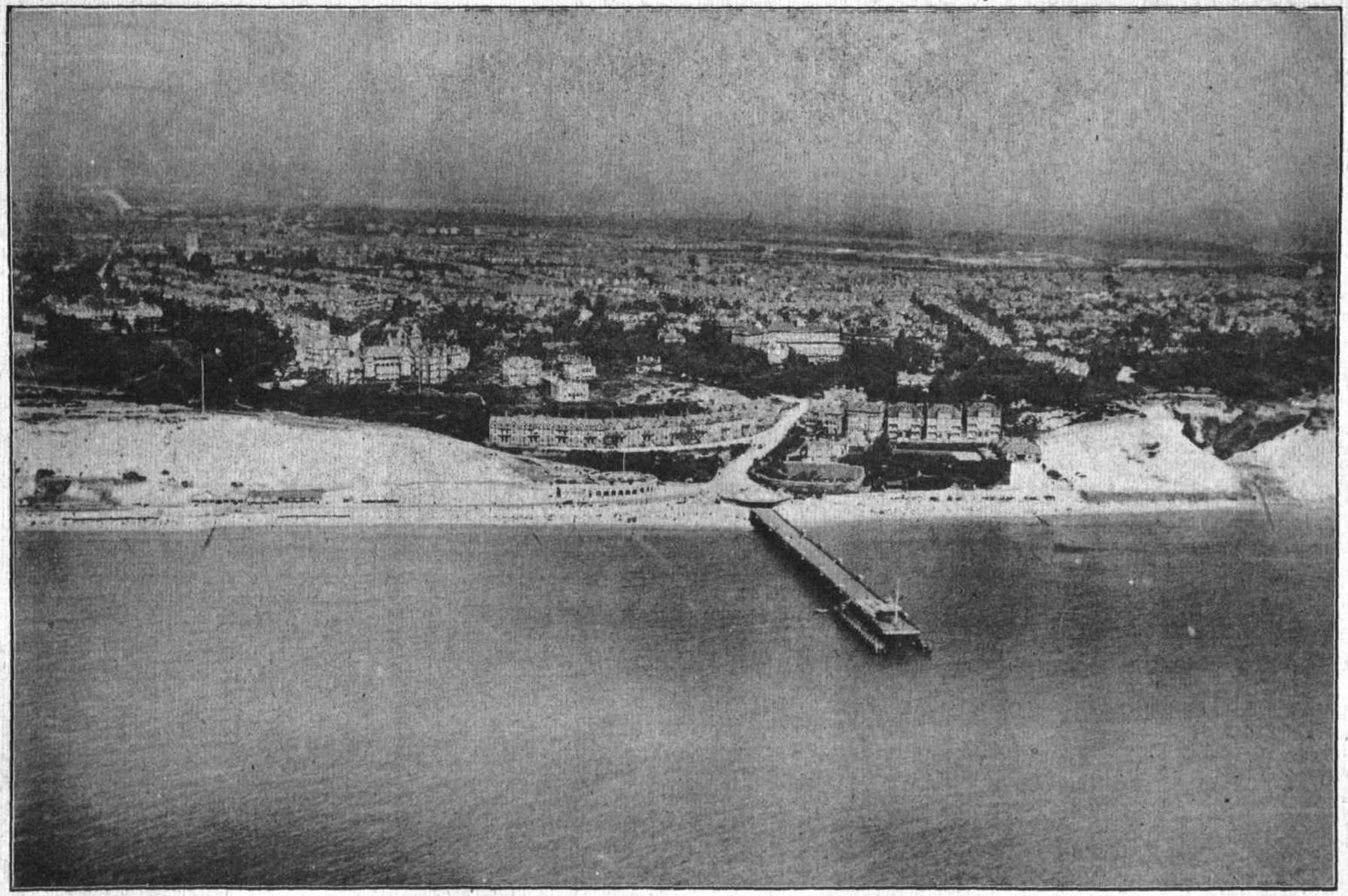
Air Events in 1920

We cannot but applaud the action of the Royal Aero Club in the organisation of aerial events during the ensuing summer season. At the annual meeting of the Club, held last week, the Duke of Atholl announced that arrangements were in hand whereby Hendon Aerodrome would probably be secured as the venue of four important races. The first, which is to be held towards the end of May, will take the form of a double circuit of London and Brighton. In June, a London-Paris race will be organised, while the 24th July has been fixed as the date of the Aerial Derby. The London-Manchester race is to be revived in August.

From every point of view this revival of the sporting side of aviation is to be welcomed. In the first place, it will give pilots an opportunity of keeping up their practice in long-distance flying, of which there has been little enough since the end of the War. We know that a number of long-distance flights have been accomplished, but these have employed a relatively small number of pilots, and in the meantime there are many hundreds of competent aviators who are rusting for want of practice. This, it may be agreed, is the least important aspect of the revival. It must exercise an important effect on design, since the reward of success is still sufficiently high to make it worth while to exert an effort to put in the best and fastest machines. Most important of all, it will assist very materially to maintain that very necessary public interest in flying upon which FLIGHT has so continually insisted as the principal means to the end of creating the pressure on the Government which is an essential preliminary to getting anything done.

There is nothing like long-distance sporting events for this. How many people will see such a race as

The Camera and the 'Plane



Boscombe, near Bournemouth, from a Supermarine flying boat

the London-Brighton circuit it would be foolish to hazard even a remote guess, but it is a certainty that millions is not too far-fetched a figure to employ. Nor can the interest be expressed in figures. For weeks before such an event, the newspapers talk about it. On the eve of the race they give the names of the entered machines and their pilots, and usually include a map and time-table of the course, so that intending spectators may be able to proceed to the best vantage points with the maximum of convenience. This gives the public a direct interest, amounting almost to the personal, in the event and there is no doubt they *do* take a very great interest in the whole affair. This means that the man in the street begins to think that he knows all about aviation, because of the way in which it is brought home to him, and when ultimately he is asked to take a closer interest, and press for the preservation of our lead among the nations of the air, he is able to visualise the problem much more clearly than as though he had not been subjected to the educational process of watching, and being intensely interested in, sporting events. Therefore, we think the Club is doing very well and wisely getting to work in earnest, and reviving the interest in sporting fixtures.

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Wireless for Aircraft

It is an open secret that the War brought a marvellous improvement in the methods of transmitting and receiving wireless messages, though certain details are even yet being jealously guarded. This, we may venture to think, is only right when it is recollected that very much of the progress has been due to the genius of British inventors, whose secrets are not even known in their entirety to our Allies. A very interesting development, which we understand will be seen at the Aero Show at Olympia in July next, is an automatic transmitter, which can be used by the pilot and which does not appear to require any expert knowledge of wireless for its operation. In one form, this instrument is designed for use on commercial machines, and consists simply of an aluminium box, along the front of which are a series of messages engraved on plates in three rows. Beside every message is a plug-socket, so that all the pilot has to do is to insert a plug, and depress a handle. As the latter returns slowly to its normal position, the selected message is sent out in Morse code, preceded by the "call" signal. The second apparatus is to be used for artillery observation purposes—it is curious how set are men's minds on improving the mechanism of war—and by the use of aerial photographs of the ground, attached to the instrument, messages relating to fire-observation can be sent back to the guns as easily as the messages sent to aerodromes and landing-grounds by the first device.

There is no doubt that to wireless development we can look with confidence to help in no small measure to securing maximum safety in commercial flying, and such inventions as those to which we have referred take us a long way on the road to such safety.

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Aerodromes and Landing Grounds

THE Air Ministry has issued the following Notice to Airmen (No. 34) :—

"The following aerodromes have been deleted from List C. (Stations temporarily retained for Service purposes.) :—

Aerodrome.	Nearest Railway Station	Nearest Town.
Cramlington ..	Cramlington ..	Newcastle-on-Tyne.
Gormanston ..	Gormanston ..	Drogheda.
Pembroke (A. and A.)	Pembroke ..	Pembroke.
Talleght	Dublin.	Dublin.

References (A. and A.) Aeroplane and airship stations.

The following aerodrome has been added to List D 1. (Civil licensed aerodromes at which accommodation is available) :—

Aerodrome.	Nearest Large Town.	Nearest Town.
Hinton Admiral Highcliffe.	Hinton Admiral..	Bournemouth.

(Note—No accommodation exists at this aerodrome at present.)

The following aerodromes have been added to List D 2. (Aerodromes licensed as "suitable for Avro 504 K and similar types only.")

Aerodrome.	Nearest Railway Station.	Nearest Town.
Priory Heath, Ipswich	Ipswich	Ipswich.
Kirn Dunoon ..	Kirn Pier (Railway boat service to and from)	Dunoon.
Locks Common, Porthcawl	Porthcawl ..	Porthcawl.

Civil Aircraft Arrangements at R.A.F. Aerodromes

THE Air Ministry has issued the following notice to airmen (No. 35) :—

"Whenever civilian aircraft land at R.A.F. aerodromes, the licences of the crew and the certificates of the aircraft will be examined by a responsible officer and any case in which such papers are not in order will be fully reported to the Air Ministry.

"The officer on duty at the aerodrome will be responsible that all charges due are paid before the aircraft is allowed to depart. Civilian aviators will be charged ordinary commercial prices for stores in connection with repairs or any labour involved."

Dropping Packages by Parachute

THE Air Ministry has issued the following Notice to Airmen (No. 36) :—

"An amendment to the Air Navigation Regulations, dated March 30, provides that the Secretary of State may, on application being made to him, grant licences to firms engaged in the aircraft industry authorising the dropping of packages by parachutes from aircraft on to dropping grounds approved by him for the purpose, subject to such conditions and for such time as may be specified in the licence, and subject also to any directions issued by the Secretary of State for the purpose of supplementing or giving full effect to this proviso."

New Official Aerodrome at Lausanne

THE Air Ministry has issued the following Notice to Airmen (No. 37) :—

"It is notified for information that the aerodrome at Blocherette, Lausanne, Switzerland, is now recognised as an official landing place by the Swiss Political Department. It possesses identical rights with Dubendorf for international aviation, but the arrangements at both aerodromes are still rudimentary. No landings can yet take place at night at either aerodrome."

London-Paris Air Mail

THE Postmaster-General gives notice that, in consequence of the removal of the terminal aerodrome from Hounslow to Waddon, the latest times of handing in letters for transmission by air mail service to Paris have been revised, and are now as follows :—

Office.	Latest time for posting. Unregistered letters, etc.	Registered letters, etc.
G.P.O. (King Edward Building)	11. 0 a.m.	10.55 a.m.
Threadneedle Street ..	10.45 a.m.	10.40 a.m.
Lombard Street	10.45 a.m.	10.40 a.m.
W.C. District Office	11.10 a.m.	11. 5 a.m.
Western District Office ..	10.45 a.m.	10.40 a.m.
Charing Cross	11.15 a.m.	11.10 a.m.
Parliament Street	11.15 a.m.	11.10 a.m.
S.W. District	11.10 a.m.	11. 5 a.m.

Aerodromes in Egypt

IT is stated that a law has been promulgated in Cairo declaring aerodromes a State monopoly.

FLIGHT

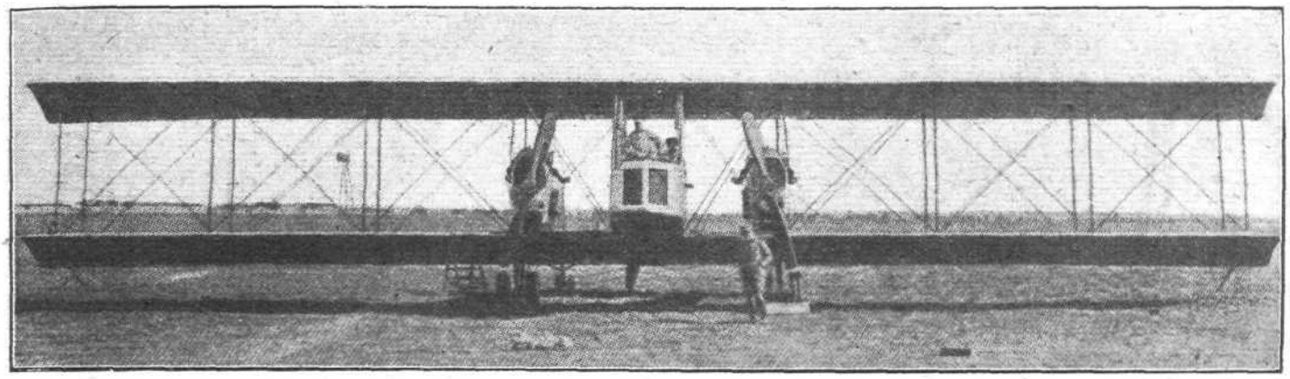
THE AMERICAN-BUILT CAPRONI BIPLANE

THE Italian Caproni biplane, which was developed during the War, and played a by no means small part in same, was from the first unique on account of its original design, viz., in having two *fuselages* and a *nacelle*, each with its own power plant. Not entirely original, perhaps, as regards twin *fuselages*, for the French Nieuport firm brought out an experimental monoplane having two *fuiselages*, but it was a single-engined machine, and the *fuselages* merely served as outriggers for the tail. In the Caproni biplanes, which have changed only as regards types of engines and minor details since the first one was laid down in 1915, the two *fuselages* not only carry the tail but carry in the nose of each an engine driving a tractor screw, whilst between the *fuselages* is a *nacelle* carrying the crew and, at the rear, a third engine driving a pusher screw.

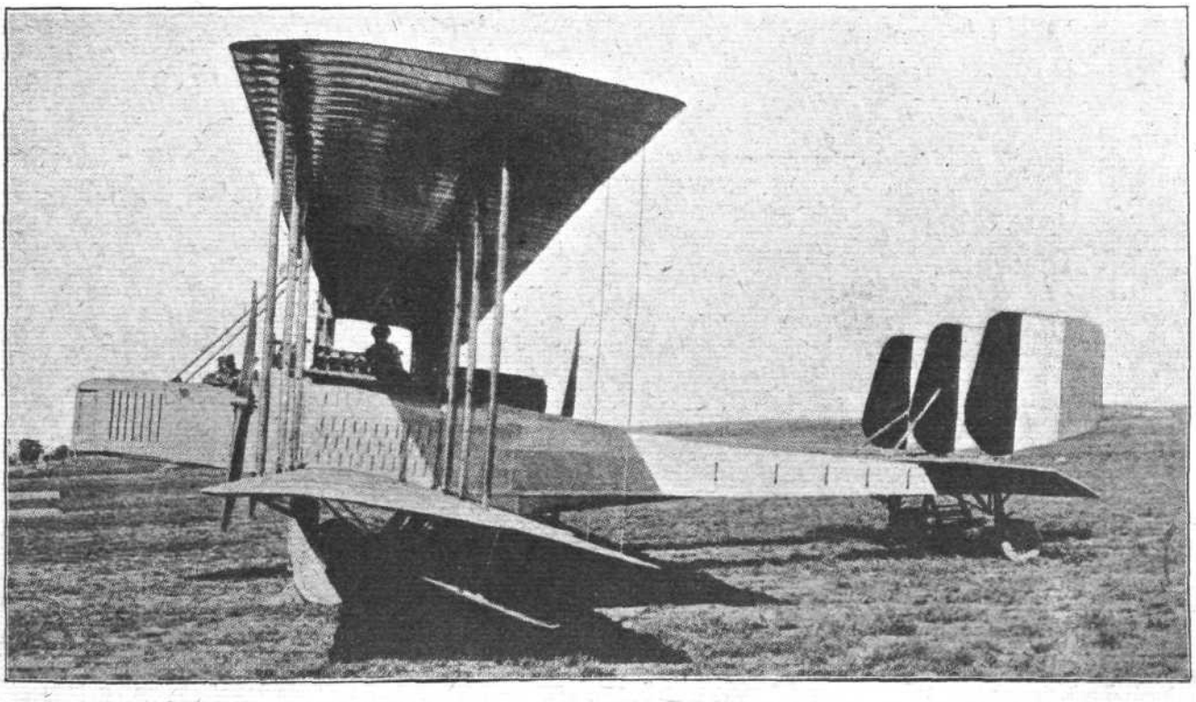
The Caproni was one of several types of Allied machines which were to be manufactured in America for use in the theatre of war, and at the time of the Armistice everything was ready for the mass production of the Caproni biplane. Several were, as a matter of fact, constructed, and the accompanying illustrations and data refer to a machine manufactured by the Standard Aircraft Corporation of Elizabeth, N.J. The American Caproni differs from its Italian prototype only in minor details, the general design being identical. It is equipped with three low-compression Liberty engines of 330 h.p. each, which being more powerful than previous power plants necessitated an increase in some of the dimensions, and to make quantity production possible, special materials and parts were systematically eliminated and replaced with parts and materials of American standard types and qualities.

The main planes are built up in five sections, corresponding sections in upper and lower planes being of equal length. The centre section, which measures some 16 ft., carries, on the lower panel, the central *nacelle*, the two *fuselages* and the undercarriage, and thus forms a main self-contained unit capable of easy transport within a minimum of space. The intermediate and outer extensions, which measure about 18 ft. 6 ins. and 13 ft. respectively, also take up little space, and are fitted to each other and the centre section by means of male and female box fittings and pins. A modification of the Eiffel No. 36 wing section is employed, the camber of the under curve being 3·267 ins. and that of the upper curve 7·618 ins., and the maximum ordinates occurring 31·496 ins. and 39·37 ins. respectively from the leading edge. The maximum thickness of the section is 4·665 ins., occurring 55·118 ins. from the leading edge. The main spars are of the box type, the centre section and the intermediate upper plane section spars being of ash, and all others of spruce or Douglas fir. They are wrapped with fabric between ribs and measure $1\frac{19}{32}$ ins. by $3\frac{5}{8}$ ins. All the ribs, double ribs and box ribs are of white wood and ash, and the capstrip is screwed in position and not nailed.

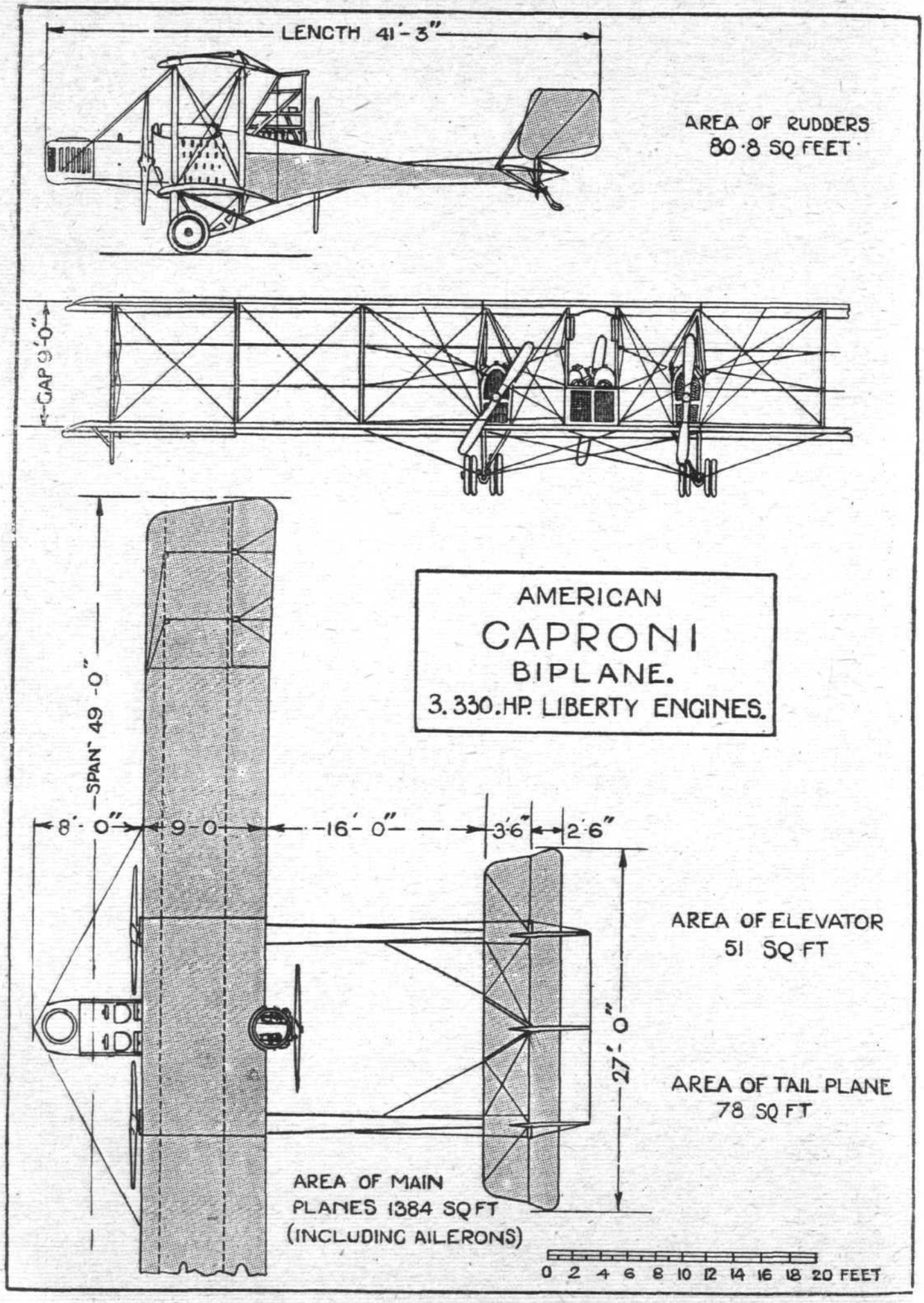
There are altogether nine bays in the complete wing structure, disposed three for the centre section, two for each intermediate and one for each outer section. All incidence wires are No. 10 steel wire, except in the centre section, where



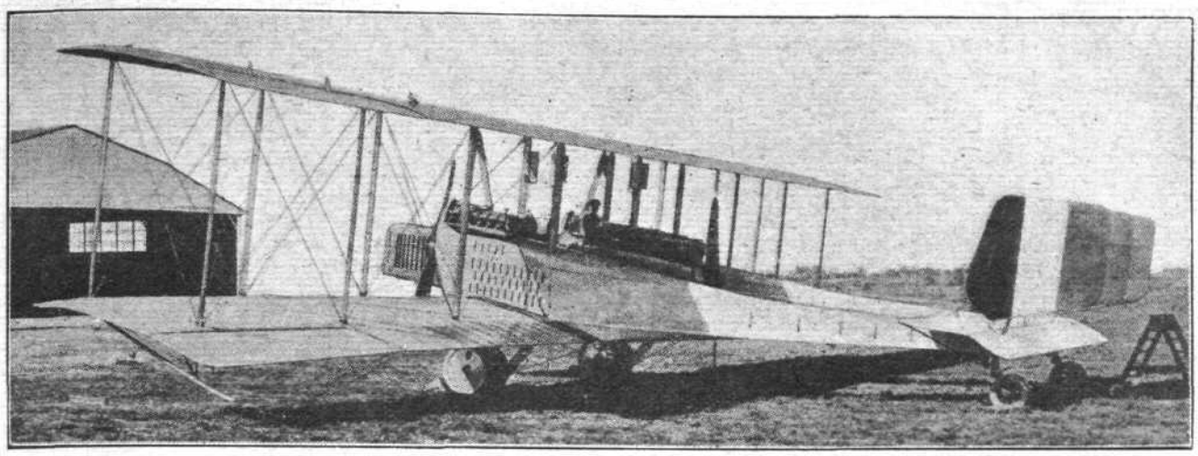
Front view of the American-built Caproni biplane



Side view of the American-built Caproni biplane



THE AMERICAN-BUILT CAPRONI BIPLANE : Plan, side and front elevations to scale

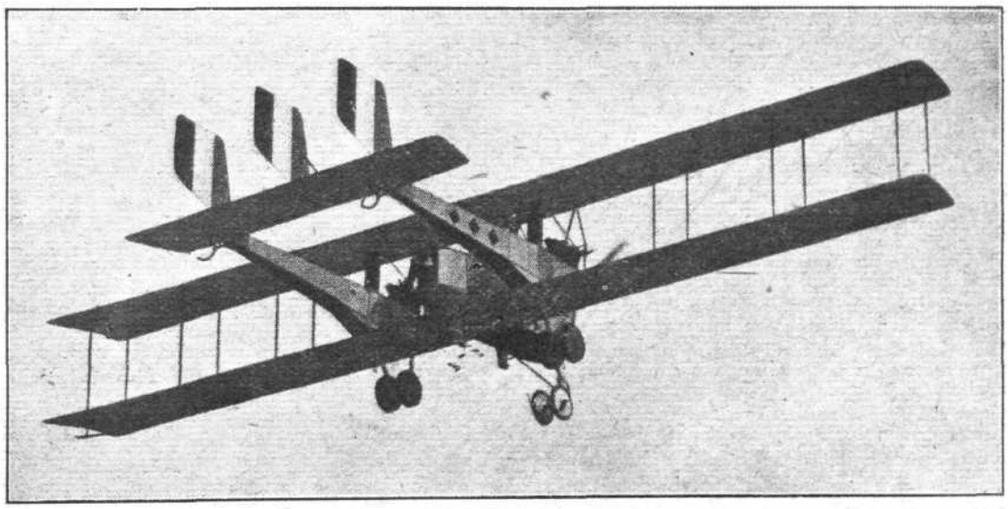


Three-quarter rear view of the American-built Caproni biplane

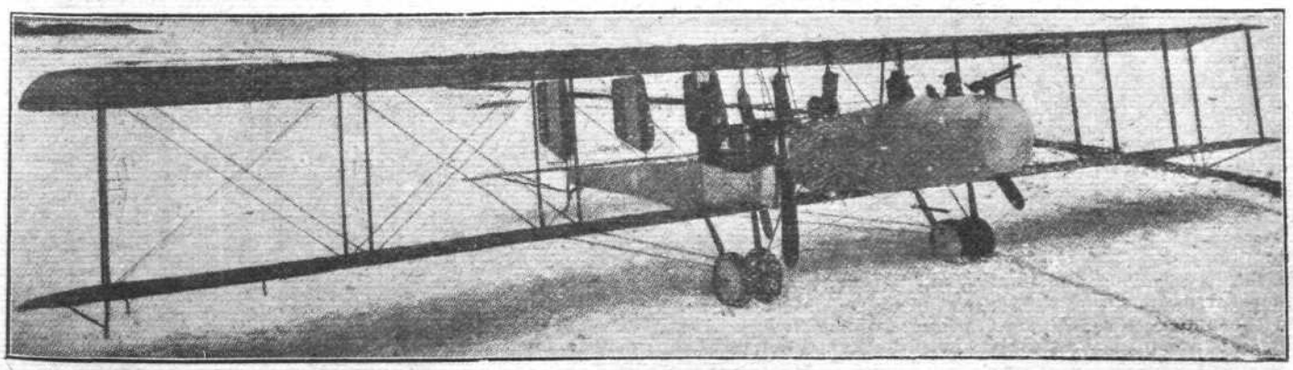
$\frac{5}{32}$ in. cable is employed, and all lift cables are doubled except in the outer section. The landing cables are single. All the cables are spliced and not soldered, and the turnbuckles are located at the bottom of the struts and are received directly by socket terminals. Two drift wires run from the nose of the *nacelle* to the tops and bottoms of the front inner intermediate section struts.

With the exception of some of the centre section struts the interplane struts are of stream-line section steel tubing, or round-section steel tubing stream-lined with spruce fairings. The strut sockets are all of the same general design, but are not interchangeable, being made heavier towards the centre of the machine to meet the increased stresses, as is also the case with the interplane struts. These strut sockets consist of two steel plates welded to the fore and aft sides of a square steel sleeve, which is slipped over the outside ends of the spars and secured to the latter by three $\frac{1}{2}$-in. bolts. Three lugs formed on the steel plates project beyond the spar, the central lugs receiving the interplane strut—a bolt passing through lugs and strut—and the outer lugs carrying bolts which serve as anchorages for the turnbuckles and cable ends of the interplane bracing. The internal bracing of the wings is, as usual, of cables and tie-rods. The covering is Grade A linen nailed on the cap-strips and edges, with maple batten strips screwed above the linen corresponding to the ribs.

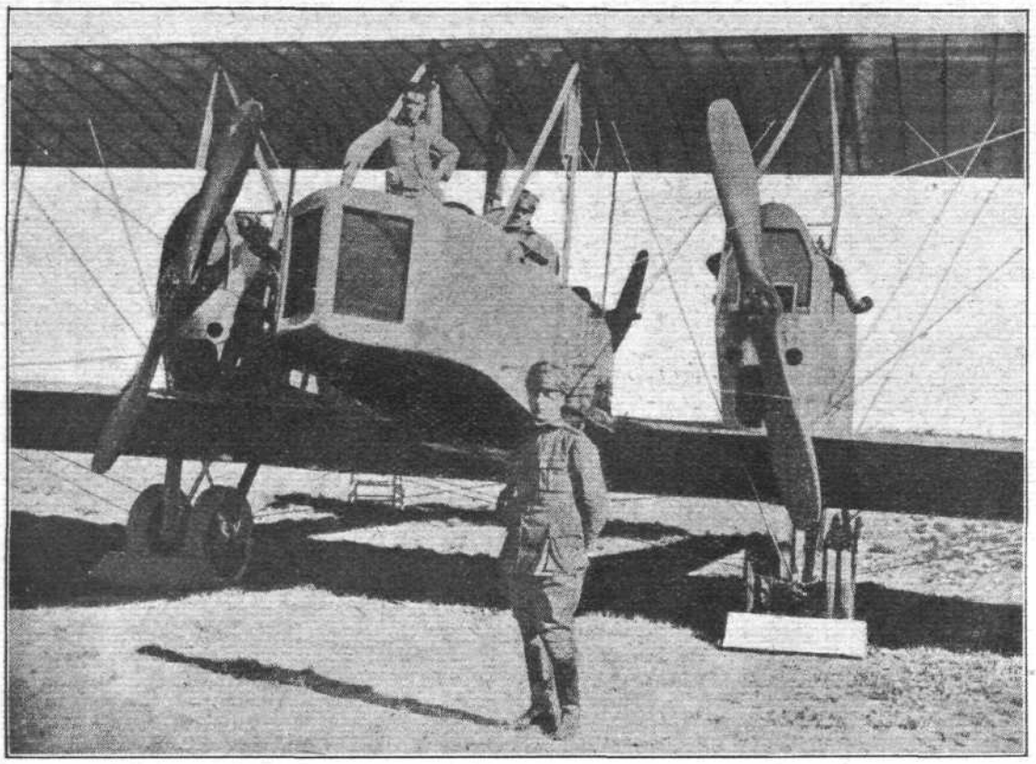
The tail consists of a high aspect ratio horizontal stabiliser, a one-piece elevator, and three balanced rudders mounted above the latter. The horizontal stabiliser is provided with a positive incidence change gear. All the tail surfaces are of steel construction (spruce also being employed in the case of the rudders), the ribs of the horizontal stabiliser being made from pressed sheet steel. The stabiliser is secured to the *fuselages* by means of steel tubes, faired with laminated spruce, two extending from the bottom of each tail post outward to the front and rear spars of the stabiliser, and two extending inwards, also to the front and rear spars. The rudders are held in place by means of steel posts, trussed together by wire, the two outer rudder posts working in the *fuselage* stern posts, whilst the central rudder post engages with a socket brazed on the rear spar of the stabiliser. A pair of stream-lined



The American-built Caproni biplane in flight



An Italian prototype Caproni, which differs from the American types in minor details only



A close-up view of the mid-wing portion of the American - built Caproni biplane

steel-spruce struts extend from the front spar of the stabiliser —at points where the inner bracing struts from the *fuselages*, are attached—to a point half-way up on the central rudder post. All levers are of stamped steel strut, and are easily removed ; only the outer rudders have levers. The control cables are carried on bronze pulleys fitted with ball bearings, and are doubled.

The central *nacelle* is built up of two laminated spruce *longerons*, and former ribs giving a good stream-line shape, and an outer covering of $\frac{5}{32}$ in. three-ply. It is secured to the lower wing spars by four ash struts, and four other struts extend, in continuation, upwards to the top plane. At the forward end of the *nacelle* is a cockpit with revolving gun-ring for the front gunner and observer, whilst immediately behind is the pilot's cockpit, providing accommodation for two, seated side by side. Dual control is provided, and in front of the pilots is a large dash on which are mounted the various instruments. Ignition, petrol and altitude adjustment are controlled for the three engines from a board located between the two pilots. The bomb-sighting device, bomb release gear, camera, radiator shutters, and the lighting and heating, are all controlled from the pilots' seats. Immediately behind the pilots' seats are two large petrol tanks, and behind these, between front and rear wing spars, is a compartment containing the bomb rack and rear gunner. The engine is supported on its bed by three braces of bass-wood, ash and ply-wood. In the nose of the *nacelle* are two radiators, with shutters, for the central engine, but the oil tank and oil radiator are mounted near the latter itself. The overall length of the *nacelle* is 19 ft. 10 ins., and the maximum width and depth 4 ft. and 5 ft. 6 ins. respectively.

The two *fuselages*, which are identical, are built up of four ash *longerons*, $\frac{3}{16}$ in. square, channeled on the vertical sides between the struts from the fifth bay to the stern post, there being 12 bays in all. The top *longerons* have one, and the lower *longerons* two lap splices, about 12 ins. long, glued, screwed and wrapped with fabric. The first two vertical struts are of $1\frac{3}{16}$ in. steel tubing, and the corresponding lower lateral struts are of ash, all other struts being of spruce ; the stern post is of steel tube. The whole *fuselage* is braced with steel wire. The tops of the *fuselages* consist of a turtle back, built up of spruce strips, secured to walnut arches with small screws. From the nose to the rear spars the covering is sheet aluminium, thence to the sternpost, the covering is fabric. The engine, with front radiators, is mounted in the nose of the *fuselage*. The *fuselages* are secured to the lower plane by U-bolts which pass over the bottom lateral struts and over the wing spars and through steel plates on the under side of the spars. Most of the fittings in the *fuselages* are of sheet steel, designed to avoid bolts passing through the *longerons*.

The undercarriage consists of two U-struts of laminated ash and spruce, wrapped with fabric and braced with steel tubing. One U-strut is located under each *fuselage*, and each axle carries two rubber sprung double wheels, the axles of which are $1\frac{5}{16}$ in. diam. by $\frac{3}{32}$ in. thick steel tubes, kept in position by radius rods ending at the extremities in a universal joint which has its seat on the same fitting on which the main bracing cables of the chassis end.

As previously stated, the power plant consists of three Liberty 12 engines, low-compression, of 330 h.p. each. The engines are inclined at an angle of 2°, and the tractor and pusher screws are 9 ft. 6 ins. diameter by 6 ft. 6 ins. pitch. Petrol is disposed in six tanks, two in the *nacelle* and two in each *fuselage*. Each tank is divided into compartments, at the bottom of which check valves are fitted, thus preventing loss of petrol should any of the compartments be pierced. Petrol is drawn from the main tanks by windmill pumps mounted on the chassis struts, and forced, *via* a central distributor in the pilots' cockpit, to gravity tanks mounted on the interplane struts.

A storage battery and wind-driven generator (600 Watts) combination supplies current for lighting.

The general characteristics of the American-built Caproni biplane are as follows :—

Span (both planes)	49 ft. 0 ins.
Chord	9 ft. 0 ins.
Gap	9 ft. 0 ins.
Overall length	41 ft. 3 ins.
Overall height	14 ft. 8 ins.
Angle of incidence	5° 30
Wing section	Modified Eiffel 36
Area of main planes (including *ailerons*)	1,384 sq. ft.
Area of tail plane	78 sq. ft.
Area of elevator	51 sq. ft.
Area of rudders (3)	80·8 sq. ft.
Area of *ailerons* (4)	160 sq. ft.
Gross weight fully loaded	12,931 lbs.
Disposed as follows :—	
Power plant	4,446 lbs.
Fuel and oil	2,700 lbs.
Passengers, equipment and instruments	695 lbs.
Armament and bombing equipment	1,581 lbs.
Wing structure	1,631 lbs.
Tail and bracing	220 lbs.
Nacelle and *fuselages*	938 lbs.
Undercarriage	350 lbs.
Useful load	2,546 lbs.
Loading per sq. ft.	9·3 lbs.
Loading per h.p.	13 lbs.
Speed (ground level)	105 m.p.h.
Climb to 6,500 ft.	11 mins.
Climb to 15,000 ft.	1 hr. 10 min.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

AERO PROPRIETARY, LTD.

THE Eighteenth Annual General Meeting of the Shareholders of Aero Proprietary, Ltd., was held at 3, Clifford Street, W. 1, on Tuesday, March 30, 1920, at 5.30 p.m., when there were present :—Brig.-Gen. The Duke of Atholl, K.T., M.V.O., D.S.O., in the Chair, Mr. Ernest C. Bucknall, Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., and Lieut.-Col. F. K. McClean. Mr. J. Stewart Mallam and Mr. H. E. Perrin in attendance.

Accounts.—The accounts for the year 1919 were passed.

Auditors.—Messrs. Andrew W. Barr and Co. were elected auditors for the ensuing year.

ROYAL AERO CLUB ANNUAL GENERAL MEETING

The Annual General Meeting of the Members of the Royal Aero Club was held at 3, Clifford Street, W. 1, on Tuesday, March 30, 1920, at 6 o'clock. Brig.-Gen. The Duke of Atholl, K.T., M.V.O., D.S.O., took the Chair, and was supported by Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Maj.-Gen. Sir Sefton Brancker, K.C.B., Mr. Ernest C. Bucknall and Lieut.-Col. F. K. McClean.

The Chairman, Brig.-Gen. The Duke of Atholl, K.T., M.V.O., D.S.O., in the course of his remarks said that the accounts of Aero Proprietary, Ltd., for the past year, which were before you, showed that the finances of the Club were in a sound position.

As regards New Premises, the Committee had hoped that we should have been in larger premises by this time. Unfortunately the premises we had in view were sold at a much higher figure than the Club were prepared to go to, and at the present time the property market in the West End was in such a state that we had little hope of acquiring anything suitable for some time to come. The Committee were, however, always on the lookout, and would avail themselves of any suitable proposition that presented itself. The response of the Members to the circular asking for financial support to the scheme for New Premises was satisfactory, and the matter would continue to receive the attention of the Committee. The present premises were now being redecorated, and every consideration would be given to the comfort and convenience of Members.

During the year under review, two very notable achievements had been accomplished by Britishers, on British-built machines. He referred to the crossing of the Atlantic and the flight to Australia.

The Atlantic Flight was open to the World, and it was a matter of sincere gratification that the direct flight stands to the credit of Great Britain. The magnificent effort of Hawker and Grieve on the Sopwith machine was followed by the successful achievement by the late Sir John Alcock and Sir Arthur Whitten Brown on the Vickers-Vimy-Rolls Machine, who won the £10,000 Prize offered so long back as the year 1909 by the Proprietors of the *Daily Mail*.

The flight to Australia was another triumph for the British Aviator flying a British machine, and Sir Ross Smith, who accomplished this flight also on a Vickers-Vimy-Rolls machine, won the Prize of £10,000 offered by the Australian Government.

With regard to future Competitions, which were our chief interest, there was the £10,000 Prize offered by the Proprietors of the *Daily Express*, which would be open from May 1 next, for a flight from Great Britain to India and back carrying a cargo of 1,200 lbs. A large number of entries were expected, and should ensure a very useful and interesting race.

As regards purely sporting races, a Racing Committee (consisting of Mr. G. B. Cockburn, Air-Commodore Maitland and Group-Capt. Samson) had been appointed to carry through a series of Sporting Events for this year. The Club had set aside £2,000 for prizes, and we hoped to see a revival of Aeroplane Racing, particularly for small sporting machines, which would be made a special feature of the Club's programme.

The Club had entered three Competitors on behalf of Great Britain for the Gordon Bennett Aviation Cup to be held in France and the Jacques Schneider International Seaplane Race to be held in Italy. One entry had also been made for the Gordon Bennett Balloon Race which would take place in America.

With reference to the Flying Services Fund, administered by this Club, the Club was to be congratulated in having enlisted the sympathy of H.R.H. Prince Albert, who accepted the Chairmanship of the Fund at the beginning of last year. His Royal Highness had taken a practical interest in the Fund and had attended its Meetings. The Fund had entailed a large amount of work on the Committee responsible for its administration, and in addition to His Royal Highness, Group-Capt. Samson, Squad.-Leader T. O'B. Hubbard, Col. Dore and Mr. Chester Fox fully deserved the thanks of the Club for their services.

During the past year £3,155 had been distributed in Grants and Allowances. The donations received during the year amounted to £2,760, and included £100 from His Majesty the King, and 20 guineas from H.R.H. Prince Albert and £1,000 from Mr. P. Y. Alexander.

The whole of the expenses in administering the Fund were borne by the Club, so that all sums subscribed were used for the benefit of those officers and men of the Royal Air Force and their dependents who required assistance.

At the end of the year the Balance in hand was £12,660.

The Club was working in the closest co-operation with the Society of British Aircraft Constructors. A Joint Standing Committee existed, and matters of mutual interest to both bodies were dealt with by this Committee. The Club was also working in close touch with the Royal Aeronautical Society.

The Rules for Aviators' Certificates were revised at the beginning of the year so as to bring them into line with the Rules for Private Pilots' Licences under the Air Convention, and the Air Ministry had agreed to accept the Club's Certificate as a Certificate of Competency for a Private Pilot's Licence. The Club delegates made a recommendation at the recent Meeting of the Bureau of the Fédération Aéronautique Internationale that the revised rules should be accepted by the Clubs of all countries represented on the Fédération Aéronautique Internationale, and the recommendation was favourably received.

DEPUTATION TO THE UNDER-SECRETARY OF STATE FOR AIR

On Tuesday, March 30, a deputation from the Royal Aero Club was received by the Under-Secretary of State for Air, Maj. Tryon, M.P., on the question of a scheme proposed by the Club for providing facilities for its Members to keep up practice in the three branches of Aeronautics, viz., Flying Machines, Airships and Balloons.

The Royal Aero Club was represented by :—Brig.-Gen. The Duke of Atholl, K.T., M.V.O., D.S.O., Chairman, Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Vice-Chairman, Maj.-Gen. Sir Sefton Brancker, K.C.B., Lieut.-Col. F. K. McClean, Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F., Lieut.-Col. Alec Ogilvie and Mr. H. E. Perrin, Secretary.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary.

An Anglo-Dutch Air Mail

ANNOUNCEMENT has been made by the Dutch postal authorities, that consideration is being given to a scheme for starting an aerial postal service between the Netherlands and England in co-operation with the British Post Office.

Negotiations have got to the point that companies desiring to take part in the service are invited to send in applications, whereupon the conditions of the proposed services will be communicated to them.

To Our Readers

As we continually receive complaints from readers that they experience difficulty in obtaining their copy of FLIGHT promptly each week, we draw their attention to the subscription form which is printed on page xxv of the current issue. If this is sent, accompanied by the appropriate remittance, to the publishing offices, 36, Great Queen Street, W.C., it will ensure FLIGHT being received regularly each week upon the day of publication.

THE JUNKER SINGLE-SEATER ALL-METAL MONOPLANE, TYPE D I

(*Continued from page* 380.)

Ailerons

THE unbalanced *ailerons* pivot on axes which are not quite parallel to the leading edge of the wing. They are built up in the simplest possible way. A duralumin tube forms the *aileron* spar, and to this two separate corrugated sheets are riveted, one above and one below. At the rear the two sheets are riveted together, and a D-shaped duralumin sheet, without corrugations, is riveted on to form a leading edge, and so serves to bridge the gap between *aileron* and plane. There are no formers or ribs in the *ailerons*.

The three hinges are of the usual construction, steel collars with welded-on lugs being pinned to the *aileron* spar. Corresponding lugs are riveted to the channel section strip mentioned in the wing description.

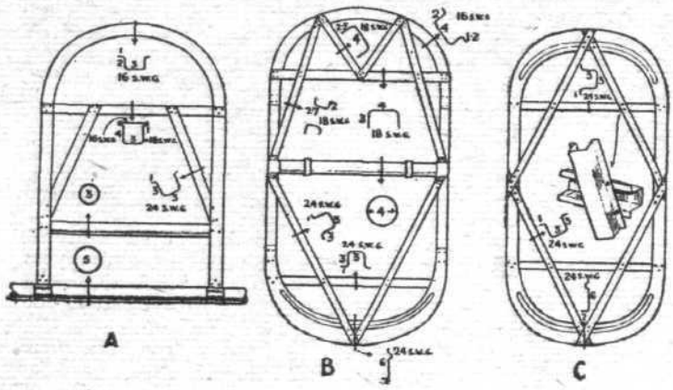


Fig. 8.—(A. B. and C.)

Fuselage

The body of the D.I. monoplane differs entirely in construction from that of the biplane. Ignoring for the moment the front armoured portion of the biplane *fuselage*, the construction of the rear part goes only one step further than that of the usual German metal tube *fuselage*.

The usual wire bracing (found in the metal-tube bodies of the Fokker and A.E.G. machines) is replaced by rigid tubular bracing. The designer of the monoplane, however, has evidently based the *fuselage* upon the familiar German construction, wherein a framework of wood *longerons* is covered with one or more skins of three-ply, and wherein wire bracing is entirely absent; and not being hampered by the necessity of arranging for armour-plating, he has been able to build a metal *fuselage* on sound "framework-and-covering-sans-bracing" lines.

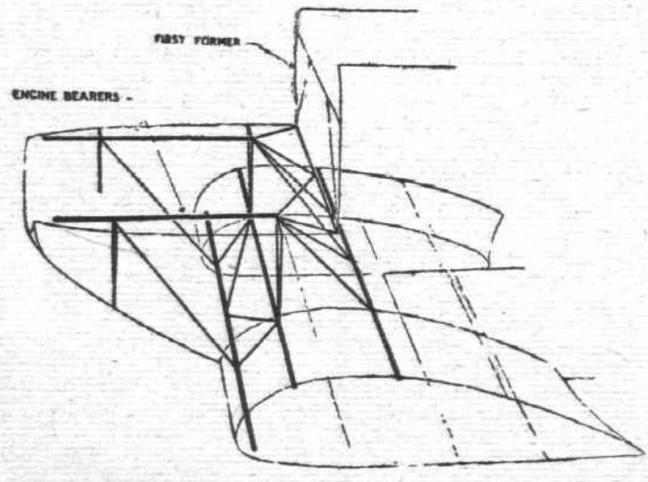


Fig. 9

Generally speaking, the body consists of a framework of duralumin formers, covered by a single riveted-on skin of sheet duralumin corrugated lengthwise.

Reference to the side-view in the scale drawings will show that the position of the built-up formers is revealed by double lines (dotted). To the rear of the pilot's seat two single dotted lines are equally spaced between each pair of double lines. These represent strips of duralumin, having a waved section, which are riveted to the covering. They are simply strips, and are not built up or braced in any way.

The rivets are of aluminium, and are placed where the hollows of the strip wave touch the hollows of the covering wave. The body finishes abruptly, immediately in front of the tail, and between this rear end and the bulkhead behind the pilot there is no construction other than the built-up formers, the strip formers, and the covering. The covering thus constitutes an important factor in the *fuselage* construction, and takes a larger share in the strengthening of the body than does the three-ply of a wood *fuselage*, where substantial *longerons* are generally employed. It is true that in the Junker a continuous channel section strip runs longitudinally along the top and bottom of the *fuselage*, thus serving to connect the various formers. This strip is so frail, however, that its obvious function is to assist in the assembly of the body by holding the formers in place while the covering is riveted on. It takes no substantial place in the actual construction.

The analogy between the three-ply construction and this metal body will now be evident—in both cases the covering is called upon to take an important share in the strength of the structure, in contradistinction to being a mere covering or fairing.

The lengthwise corrugations naturally stiffen the covering against strains tending to bend the body of the machine, and enable the skin to be the only factor in the construction which does perform this function. The strong cross bulkheads provide stiffness in the direction of the covering's greatest weakness, *i.e.*, against strains tending to deform the cross-section of the body. Thus, between the two a very rigid structure is obtained. A further analysis of the comparison and contrast between three-ply and metal construction leads one to realise that the corrugations take the place of the wood *longerons* found in the three-ply system.

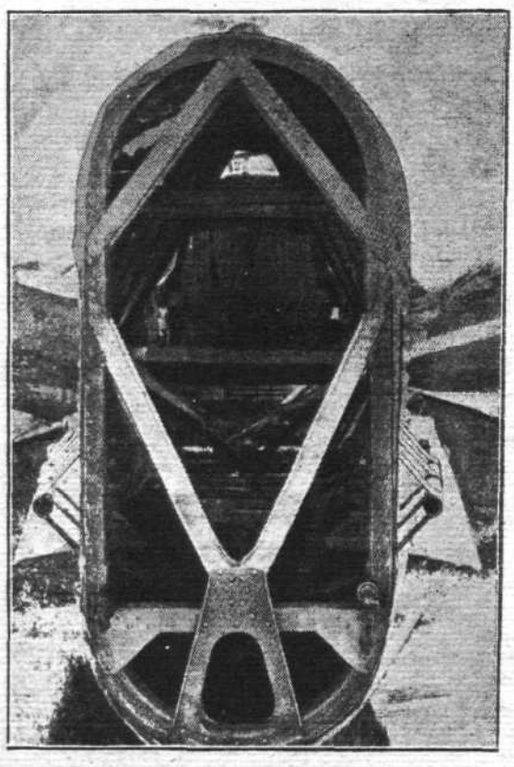


Fig. 10

Fore Part of Fuselage.—The simple construction of the *fuselage* is modified forward of the pilot's cockpit. To allow the necessary elbow-room for the pilot, it has been necessary to eliminate one bulkhead, and the space between the former just behind the pilot, and the one immediately behind the

engine—a distance of nearly 4 ft.—is braced with a scheme of triangulated channel-section strips, which are riveted to the inside of the *fuselage* skin. The side view of the machine given in the scale drawings shows quite clearly the system employed. The cross strains here are taken by the wing spars, the tube supporting the front of the pilot's seat, and the wind-screen support. This last is of L-section steel, of fairly heavy gauge.

The foundation of the construction forward of the cockpit is provided by the centre section wing spars. The middle of the three upper spars forms the bottom of the first cross former, drawn in Fig. 8 (A), and in Fig. 9 is shown, diagrammatically, the system of tubular bracing which supports the engine bearers. All the joints are made on the same principle. A steel collar is riveted round the duralumin

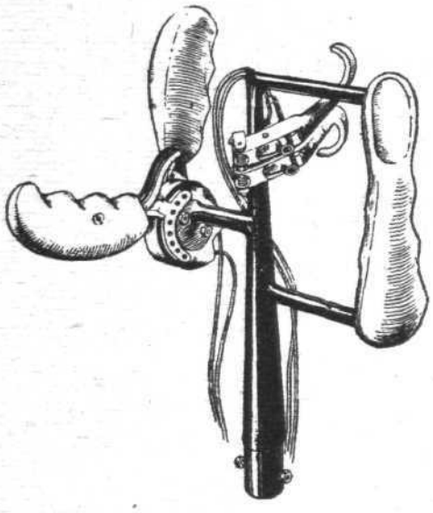


Fig. 11

tube to which other tubes are to be attached, and lugs welded on wherever these tubes finish; their extremities are flattened and riveted directly to the lugs. Most of the tubes are of 18 S.W.G., and of 20 mm. outside diameter.

The Bulkheads.—Fig. 8 (A) is a diagram of the bulkhead behind the engine. It also figures in Fig. 9. The various cross-sections and gauges are marked.

Fig. 8 (B) is a diagram of the former immediately behind the pilot. The flat-sided oval which constitutes the outside framework is of channel-section duralumin, with flanges for riveting, and is in four portions. The top part extends to the line just below the upper cross-bar, and is of 16 S.W.G. as marked. The figures placed near the various sides of the cross-section represent the lengths of those sides in centimetres. The two straight side pieces are of similar cross section, but of 20 S.W.G. metal, while the lower portion is of 24 S.W.G. metal, with the cross-section indicated. Across the middle a 4 cm. o.d. duralumin tube passes, and is riveted at the ends to the side pieces. Above and below this tube, and parallel to it, two strips are riveted in position; the respective sections are shown. The lower half is braced by a Vee as indicated, and this is the normal bracing for each half in other bulkheads. The bracing is modified, however, in the upper half, and takes the form of a letter M, the reason being that the peculiar inverted U seen on the top of the *fuselage*, just to the rear of the pilot, is attached to the two upper points of the M. It will be noticed that the side limbs of the M are each composed of two similar strips.

The next bulkhead is 50 cm. behind, and is shown diagrammatically in Fig. 8 (C). It has no central cross tube, but has the usual diamond of bracing strips. Sections, sizes and gauges are shown.

Between these two are found the two waved section strips mentioned above. The next three bulkheads (Nos. 4, 5 and 6) do not differ from this one except in dimensions, and each pair is separated by two waved strips. The seventh former is the last one of the *fuselage* bulkhead, and is modified to accommodate the four points of attachment of tail portion to body. Fig. 10 is a photograph of this bulkhead, and incidentally shows many of the points already described.

The rear detachable portion of the body is dealt with under the head "Tail Unit."

Fuselage Covering.—The pitch of the corrugations is about 1¼ ins., and the depth about ·33 in. The thickness is ·015 in. (about 28 S.W.G.), except the engine cowls, which are ·01 in. thick.

Five sheets are employed, each without joint from front to rear—

(1) One sheet covering the bottom of the body.
(2) and (3) Two symmetrical side sheets.
(4) and (5) Two symmetrical top sheets.

In addition, two smaller sheets serve as port and starboard engine cowls. The lines of junction are shown in the scale drawings.

External and Internal Fuselage Fittings.—The corrugated covering is continuous from the rear to the front of the body, except that hinged cowls cover the engine on each side.

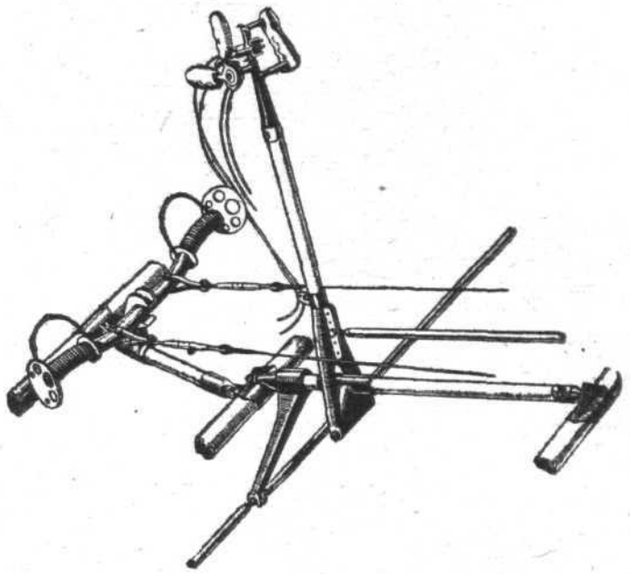


Fig. 12

Over the front portion of the wings may be seen (in several photographs) rectangular holes which were originally covered by sheet duralumin doors. They are intended, of course, to allow access to the engine sump, etc. Examination of Fig. 5 will reveal a stirrup to facilitate entry into the cockpit. This is found on the port side only, and is constructed of stout duralumin tube, riveted to the side by means of two bent strips of duralumin. Directly behind the pilot may be seen a kind of pylon, which is clearly visible in several illustrations. This is very strongly constructed of stout steel tubes, welded together. Its function cannot be named with certainty, but it is highly probable that it is intended to save the pilot in the event of the machine overturning. It is possible that a certain amount of reluctance to fly all-metal machines was evinced by pilots, and this is probably a concession to them. A little to the rear of the black cross painted on the *fuselage*, and in line with its horizontal component, there is on each side of the body a small rectangular door. These doors give access to the swinging support of the elevator control tube described later.

Handles for lifting the tail of the machine while on the ground are fitted at the rear of the body at either side. Their

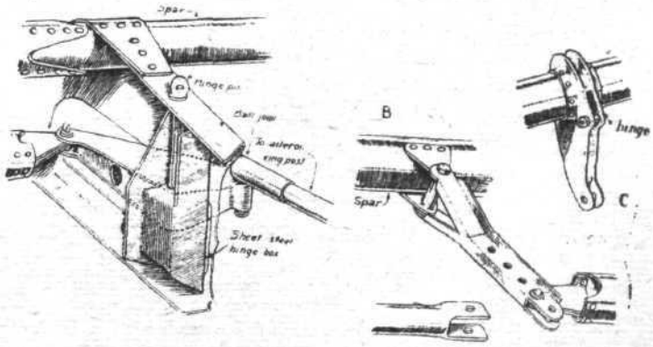


Fig. 13.—(A. B. and C.)

construction is exactly similar to that of the step, and their exact position is revealed in the photographs.

The pilot's seat is constructed of corrugated duralumin riveted to a channel-section framework, and clipped to the

bulkhead immediately behind. Its position is not adjustable. The bulkhead just mentioned—the one directly behind the pilot—is made airtight by the fact that a piece of fabric is held between bulkhead and skin by the rivets employed to hold both together.

Controls

The D.I. Junker carries a stage further the tendency towards positive control lately evident in German machines. Both *aileron* and elevator are operated by steel tubes, and only the rudder control is by cable. It may be mentioned, in

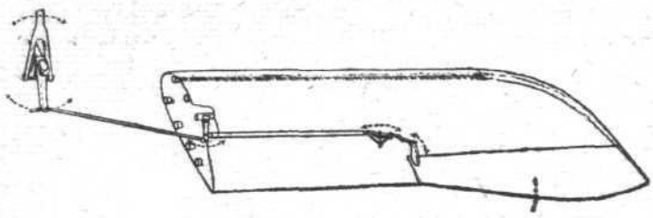


Fig. 14

passing, that these cables are the only ones that could be found anywhere on the machine.

The head of the control lever is shown in Fig. 11. It will be noticed that the left-hand grip constitutes a throttle control, the idea of the two handles probably being to ensure that at any opening of the throttle one of the grips shall be in a convenient position. The two machine gun controls are also clearly shown.

Fig. 12 gives a clear idea of the general control arrangements. The joy-stick has a welded steel triangular base, and is pivoted on a bolt, which forms the base of the triangle. Parallel vertical lugs, each carrying five holes, are welded on what roughly corresponds to the apex of the triangle, and in one pair of these holes the eye-boat is hinged which forms one extremity of the elevator-control tube. So far as this elevator-control is concerned, therefore, two kinds of adjustment are possible. Firstly, the actual length of the compression tube between joy-stick and elevator king-post is adjustable. This, apart from the purely mechanical considerations involved, allows the relation between joy-stick and elevator to be varied within certain limits, so that when the joy-stick is vertical it does not necessarily follow that the elevator is neutral. Secondly, the five holes on the joy-stick allow of an adjustment of gearing between joy-stick and elevator, so that this latter may be arranged to move through five different angles for the same amount of movement of the joy-stick.

Fig. 13 (*c*) is a sketch of the elevator king-post, and in Fig. 10 may be seen the swinging support for the elevator-control tube. Owing to the two converging pieces being broken off, the exact type of joint used cannot be ascertained.

The *aileron* control is particularly interesting, and may be understood more clearly by referring to Fig. 14. It will be seen that a lateral movement of the control lever actuates a longitudinal rocking shaft, which carries a downward pointing arm, forked at its lower extremity. Between the jaws of the fork are pivoted the extremities of two light steel tubes of 20 mm. diameter, which pass one through each half of the centre section, and finish in fork ends. The length of these tubes is adjustable at the inner ends, and the welded joins, which constitute the outer ends, are bolted to a short arm pivoted in turn to the rearmost of the three upper spars, about 6 ins. from the root. This arm has five pairs of holes to accommodate the ends of two tubes—the control tube already described as passing from joy-stick to the arm, and another second tube passing inside the wing, vertically under the upper rear wing spar. This second tube is of duralumin (diameter 35 mm.), and its outer extremity is pinned to a kind of bell crank, to the upper point of which is fitted a short steel tube connecting bell crank and *aileron* king-post. It is evident that this steel tube must work at right angles to the wing spars, and to allow for this change of direction, the joint between bell crank and steel tube is of the ball and socket type.

The adjustment of the gearing between control lever and *aileron* is effected by means of the five holes in the pivoted arm. The number of possible variations in gearing is as many as 20, but not all of these come within the range of practical utility. The diagrams marked Fig. 13 show the mechanical details of the *aileron* control, (A) being the hinge, (B) the pivoted arm, and (C) the elevator king-post.

The rudder bar is of the conventional type (*see* Fig. 12) and is made of steel tubing. Cables connect the bar with the rudder king-post, so that the rudder control does not depart in any particular from the usual system.

(To be concluded.)

New Under-Secretary of State for Air

AMONG the Ministerial appointments announced on April 3 were the following :—

Major G. C. Tryon, M.P., to be Under-Secretary to the Ministry of Pensions, in succession to Sir James Craig.

The Marquess of Londonderry, K.G., to be Under-Secretary of State for Air, in succession to Major Tryon.

Bedford Airship Factory Transferred

THE Air Ministry announces that it has been decided that the airship constructional works at Cardington, near Bedford, which Messrs. Short Bros. constructed and managed during the War for the Admiralty, are to be taken over by the Air Ministry.

In addition to being the most convenient as regards position, these works are the most complete of the airship constructional establishments built during the War for the production of rigid airships, and Messrs. Short Bros. are to be congratulated on their excellent organisation and arrangements which have led to this satisfactory result.

Gen. Sykes Flies to Paris

THE Air Ministry announced on March 31 :—

The Controller-General of Civil Aviation, Maj.-Gen. Sir F. K. Sykes, K.B.E., K.C.B., C.M.G., left Croydon aerodrome at 1.50 p.m. today by aeroplane for Paris in order to consult with the French civil aviation authorities. He travelled by the ordinary daily Airco machine in company with two of his staff.

The aeroplane is equipped with a wireless telephonic installation fitted by the Marconi Co., and the opportunity was taken to carry out wireless telephonic communication with the aerodromes *en route* on both sides of the Channel.

The arrival of the party at Le Bourget aerodrome, Paris, at 4.10 p.m. was notified to the Air Ministry by wireless. During the passage, good telephonic communication was kept up with Croydon; immediately after leaving, with Lympne; from over Tonbridge, and from mid-Channel; and finally with Le Bourget on approaching Beauvais.

The result shows the value of the system both for purposes of keeping in touch with areoplanes from the ground, and for informing pilots of the weather conditions ahead of them.

A Canadian Air Force

IT has been officially announced in Ottawa that a Canadian Air Force is to be formed immediately, the *personnel* to be drawn from volunteers from the ranks of ex-officers and men of the R.A.F. resident in Canada.

At the start the Force will probably be limited to about 5,000, inclusive of all ranks, as, for the present, the Government recognise the need for keeping the expenses as low as possible. It is intended that there shall be one or two training centres and volunteer provincial executive committees of seven will administer the Force by provinces. The age limit is set at 30 for junior officers and 38 for senior.

Negotiations have been opened with the Air Ministry with a view to ascertaining the exact position of officers on the R.A.F. reserve list who serve in the new force.

Australia Declines Blimps

COMMENTING on cabled report that the British Air Ministry officials were surprised at Australia's refusal of their offer of small non-rigid airships, Mr. G. F. Pearce, Minister of Defence, declared that the airships offered were not of the type required. But Australia was not ungrateful, as apparently had been suggested.

A New Aircraft Carrier

THE ocean-going aircraft carrier *Eagle*, laid down at the works of Sir W. G. Armstrong, Whitworth and Co., Newcastle-on-Tyne, in February, 1912, as the *Almirante Cochrane*, and re-designed by Sir E. H. Tennyson d'Eyncourt, was commissioned in the Tyne on April 6 with a Devonport crew for local trials, after which she will proceed to Portsmouth to carry out trials as an aircraft-carrier. The *Eagle* is under the command of Capt. E. V. F. R. Dugmore.

The Crew of the R. 38

WORD comes from New York that a crew of 18 men and 3 officers of the United States Navy were to sail for England on April 5 on the transport *Princess Matoika* to attempt a Transatlantic flight in the dirigible R. 38, recently purchased from the British Government. Commander Louis M. Auxfield and Lieut.-Commander V. N. Bieg will command.

FLIGHT

CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

THE CASE FOR CANTILEVER WINGS

[2008] In his paper on cantilever wings, "Marco Polo" suggests the use of a wing having a wash-out from root to tip of 4° to 0°. It is not generally known that under certain conditions a wash-out of this nature may be a source of lateral instability rather than the reverse. Suppose, for example, that the relative wind around either wing of such a machine suddenly develops an upward trend of 2° from the horizontal. For all practical purposes lift varies directly as angle of incidence, and, if normally at the root 4° corresponds to 100 lift units and at the tip 0° to 0 lift units, then under the conditions of the upward gust the lift at the root will become 6/4 of 100 units, *i.e.* 150, and at the tip 2/4, *i.e.* 50. Not only will there be a tendency for equilibrium to be disturbed by the increased lift on the wing, but also the effect of the disturbance will be enhanced by a movement of the centre of pressure to a point nearer the wing-tip than normally. On the other hand, if the wing were graded in the reverse direction, *i.e.*, 4° at the tip and 0° at the root, stiff stability, or undisturbed equilibrium, might prevail.

May I say that I deduced this principle of reverse grading from the longitudinal dihedral principle some time ago, the argument, taking hypothetical angles of incidence, being somewhat analogous to the argument generally stated in expositions of the latter principle. Of course, the principle of reverse grading has little to do with longitudinal stability, although at times one may be required to study the principles of stability in all three planes simultaneously.

I will not go so far as to advocate the use of wings of reverse grading, but I do think that the use of a wing of constant chord, camber and attitude, throughout its entire span, is amply justified by the fact that it is the most economical proposition from the production point of view and a sound engineering compromise between the opposing elements in aerodynamical stability.

DOUGLAS SHAW, M.I.Ae.E. (F.),
Secretary to the Institute of Aeronautical Engineers

[We submitted Mr. Shaw's letter to the author of the article criticised, and the following is his reply.—ED.] :—

"I am afraid that I do not altogether follow Mr. Shaw's reasoning. If I read his letter aright, he takes the case of a gust 'with an upward trend of 2°' striking one wing (and not the other) of the machine. It appears to me that this case will always produce rolling, no matter how one plays about with wash-ins or wash-outs. In some earlier aeroplanes (Breguet and Caudron) an attempt was made to counteract this by having the wings flexible so that they should yield or 'give' without upsetting the equilibrium of the complete machine, but it was found, I believe, that this wing-construction was liable to fatigue, and it is now never seen.

"I do not quite see how a wash-in would help matters, and it appears to me that Mr. Shaw does not take into account the fact that the wing suggested by me has a different lift coefficient for each of its sections counting from root to tip. The end rib, *m*, reaches its maximum lift at an angle of about 14°, while the inner rib, *a*, has its maximum lift at about 20°. If, therefore, the machine is flying at such an attitude that its end rib is at an angle of about 14°—supposing it to have a wash-in of 4°—the root rib, *a*, will be at an angle of 10°. If the angle is increased either by a gust having an upward trend, or by the machine rolling slightly to one side, the angle of incidence on the end rib is still further increased, it passes its critical angle and its lift falls off, thus tending still further to increase the roll already started.

"I certainly cannot agree with Mr. Shaw in his contention regarding the wing of constant chord, camber and attitude, except on the score of cheapness of manufacture. Aerodynamically I have nothing against it, but structurally it is inferior to the tapered wing, as I indicated on page 311 of FLIGHT for March 18, where it was shown that for a uniformly distributed load the bending moment would have been 13,750 lb.-ins., instead of the 8,000 lb.-ins. found for the tapered wing. 'MARCO POLO'"

PARACHUTES

[2009] In his letter published March 25, Maj. Orde Lees very frankly recalls that on the occasion of his first introduction to parachuting the writer was present as a technical expert to ensure that there should not be any accident due to oversight or carelessness such as more recently caused the death of Capt. Caldwell.

I do not think that I have in any letter advanced the view that the parachute which Maj. Orde Lees demonstrates is unsuitable for exhibition drops even at a low altitude, either from a fixed structure, balloon or selected aeroplanes when flying suitably under full control.

In the early correspondence I cited the large number of cases wherein parachutes that extend the silk body before detachment have been ripped by tailskids and I agreed with Lieut.-Col. Holt on the extreme risk to such apparatus when used as an actual life-saving appliance from a machine that is crippled, spinning or out of control.

But I strongly challenged a somewhat general condemnation of "positive" opening parachutes because I so fully realise the importance of a parachute functioning with a given length of fall, and I suggested a scheme for fair competitive tests under the nearest possible approximation to actual use in an emergency.

According to Maj. Orde Lees all parachutes that he has seen are erratic in their time of opening except those made by his present employers. But the "Salvus" positive opening parachute when tested almost immediately after his release from official position, readily demonstrated equal reliability in opening combined with instant detachment which enabled it to readily clear the most difficult machines, and as Maj. Orde Lees had previously had for over six months an opportunity to make aeroplane trials with the "Salvus" parachute submitted to him for that purpose, he has really only himself to blame for not having personal evidence of this fact.

Maj. Orde Lees as his final paragraph lays down as an axiom that "*Parachute reliability is synonymous with repetition of performance under identical conditions.*" But if during a series of trials the silk body were consistently ripped on the tailskid, these conditions would be fulfilled and yet the results could hardly be deemed reassuring to prospective passengers.

I would suggest as a more suitable phrase that "*Parachute efficiency is synonymous with successful functioning under widely varying conditions,*" so that as an emergency means of escape from aircraft the apparatus may be relied upon not only from a low altitude, but no matter whether the machine is climbing, diving, spinning, or in any way out of control.

ERNEST E. SMITH, A.M.I.Mech.E.

Westminster, March 31.

FLYING RACES AND OPEN EVENTS

[2010] No details have yet been made public with regard to the forthcoming flying races to be held at Hendon under the auspices of the Royal Aero Club, but possibly as they are mainly being held with a view to stimulating the home industry, they may be confined to British competitors. I venture to hope, however, that at least one open event will be arranged so that the public may have an opportunity of seeing some of the notable pilots of France, Italy, and perhaps other Allied countries. The amount set aside by the Club for these competitions hardly allows for sufficient inducement to be offered to pilots to come over from the Continent, but possibly some other means may be found of providing the necessary prizes.

D. W. THORBURN

Fireproof Khaki

IT is understood that some important tests were recently made at Aldershot in the presence of Major Crook, inspector of fire services, of specially manufactured fire clothing for pilots and men in the Royal Air Force.

The suits, which include a specially devised cloth helmet, were placed on dummies, subjected to petrol sprays, and set alight.

It is stated that although the flames ascended to a great height, the khaki fabric was scarcely scorched.

The British Empire Air League

GEN. SEELY was elected president of the Air League of the British Empire at the annual meeting last week at 46, Dover Street, Piccadilly.

The report stated that it was the view of the league that not only should commercial aviation be so built up and fostered by those in power that it should be available for purposes of national defence, but what was of more importance than financial assistance was care and a willingness to make use of commercial flying in every way possible.

THE STRESSES IN THE UNDERCARRIAGE OF AN AEROPLANE

BY "A MERCHANT"

GENERALLY in the landing of an aeroplane the greater part, if not all, of the shock is taken on the undercarriage, where there is a means of shock-absorption between the wheels and the component to which the undercarriage is attached. In ordinary-sized aeroplanes this component is the *fuselage*. In some cases of landing, however, it is possible that the rear skid may take a share of the landing load, but it is not proposed to deal with this component at present. Fig. 1 shows three views of a very common type of undercarriage, and for the purpose of finding the loads in the members, it is assumed that the landing load is vertical, as shown, since this is probably the simplest case. The ordinary means of obtaining the loads in the members of an undercarriage is by using the "Gauche" method of projection, which is more or less well known, but perhaps not frequently used. Its application to this particular case is very apt, and the results obtained depend merely on accuracy of draughtsmanship. Let 2W be the total weight of the aeroplane, then each wheel will take a load of W. The undercarriage is braced between the front struts only, and it is to be assumed that the bracing takes load, and that no load is taken by the axle or cross

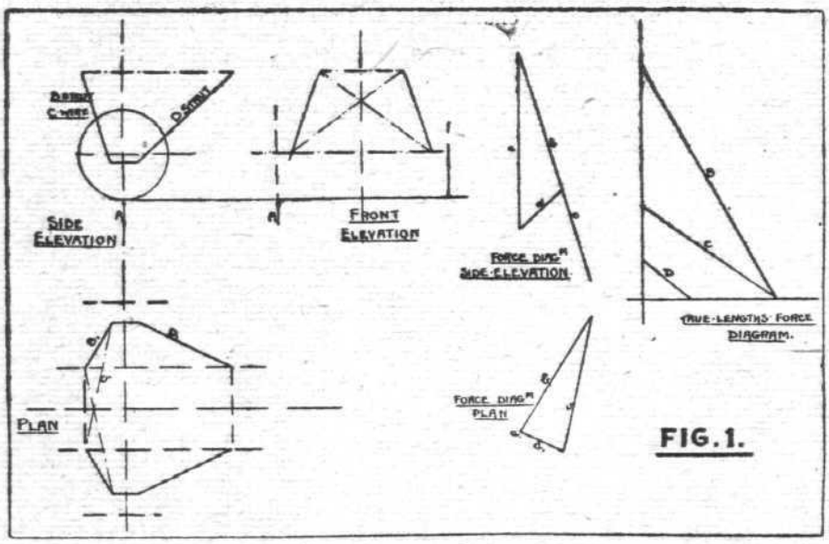


FIG. 1.

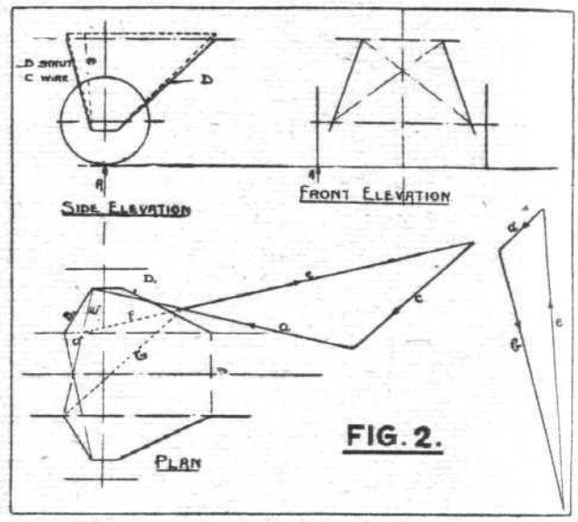


FIG. 2.

tubes other than loads due to bending arising from the overhang of the wheel. The force diagram involves two projected views whose outlines are respectively parallel to those of any two projected views in the position diagrams. In the example, the plan and end elevation have been chosen from which to draw the force diagrams. Let the position diagram be lettered as follows :—

Vertical upward force denoted by A in elevation and A_1 in plan.

Front strut denoted by B in elevation and B_1 in plan.

Cross bracing wire denoted by C in elevation and C_1 in plan,

Rear strut denoted by D in elevation and D_1 in plan.

Drawing the force diagrams, a length, W, is set off to some scale in elevation and denoted by the letter *a*, and an arrow head to show the sense of the force. The plan of this vertical line is obviously a point a_1. From the upper end of the vertical line, *a*, in elevation, draw a line parallel to the front strut, B, and simultaneously from the point A_1 in plan, draw a line, b_1 of indefinite length parallel to B_1. From the lower end of the line, *a*, draw a line parallel to strut D, to cut line *b*, which fixes length of *d*, and by projection the length of d_1. The length of *b* is still indefinite, and so, in order to fix it, draw c_1 parallel to C_1 in plan, cutting b_1. Thence, by projection, the lengths of *b* and *c* are obtained. The force diagram is now completed, and it only remains to find the true lengths of the force lines in order to obtain the real forces in the members. This has been done as shown in the diagram, and probably needs no further elaboration. Another method of solving this problem of the landing gear may appear somewhat easier. It is an application of a method used to find the loads in a "three-legged structure" with a load suspended from the apex, or, for example, the "sheer legs" problem. To show the analogy of the sheer legs problem to the undercarriage, let us imagine the undercarriage to be inverted. Then the members meeting in a point at the apex of the structure are (considering one side of the undercarriage only) the two legs and the cross bracing wire. The applied load in this case is vertical as before, and is transmitted through the wheel to the members of the undercarriage. The first step in the solution is to imagine a vertical plane including the cross bracing wire. This plane would cut the plane of the two legs in a line E, (see Fig. 2, plan), and this line may be imagined to represent a strut in the plane of, and replacing, the two legs. Our structure has now been reduced to two members, a wire, C, and an imaginary strut, E, replacing the two legs, B and D, and is loaded at the apex, where the wheel is affixed. A simple application of the triangle of forces will give the true load in the wire, C, and the load in the imaginary strut, E. For this purpose the true shape of the structure (reduced as described) is laid out as shown by dotted lines, F and G, and the triangle of forces drawn. This enables us to read off the loads in the wire, C, and the imaginary strut, E. The load down the imaginary strut may now be resolved along the two legs which it had replaced. This is easily accomplished by setting out the true shape (shown dotted) of the plane of the legs in elevation. Now by drawing a triangle of forces we obtain the true loads in these two members, which completes the solution. The loads found by this alternative method agree with those previously obtained.

As a second example involving one or two further difficulties, let us take the case of an undercarriage of another type, such as the one shown diagrammatically in Fig. 3, in which there is cross-bracing only between the two rear legs of the four which form the inverted "V" portion of the gear. In this case the load is no longer vertical, but is assumed to operate along a line joining the axle centre to the centre of gravity of the machine. As in the first example (Fig. 1), a force diagram is drawn in two portions, the one projected from the other. Let A be the load on one wheel taken by the legs and cross-bracing wire, and having direction as shown (Fig. 3). It should be noted that the side elevation and front elevation are used quite optionally in this case. The front inverted "V" struts are denoted in side elevation and front elevation by B and B_1 respectively. Similarly, the rear inverted "V" struts are denoted by C and C_1, the cross-bracing wire by D and D_1, the rear struts by E and E_1, and the front cross-tube by F and F_1. The load A will be taken on the two joints of the inverted "V"—*i.e.*, $\frac{A}{2}$ at each. As before, the two projected parts of the force diagram must be drawn simultaneously. Starting from the upper point we draw the portion *b* and *f*, and b_1 and f_1, respectively. Now set out the force *y* and y_1 in the two views, and from the lower ends of the lines representing this force draw lines *e* and e_1 parallel to E and E_1. This load represented by *e* and e_1 is now determined by drawing *c* parallel to strut C, and the diagram is completed by drawing the remaining forces represented by *d* and d_1, and c_1 parallel to the struts so defined. The true magnitudes are now measured from the true length diagram. Applying again the alternative method of solution as being, perhaps, somewhat simpler on the average (see

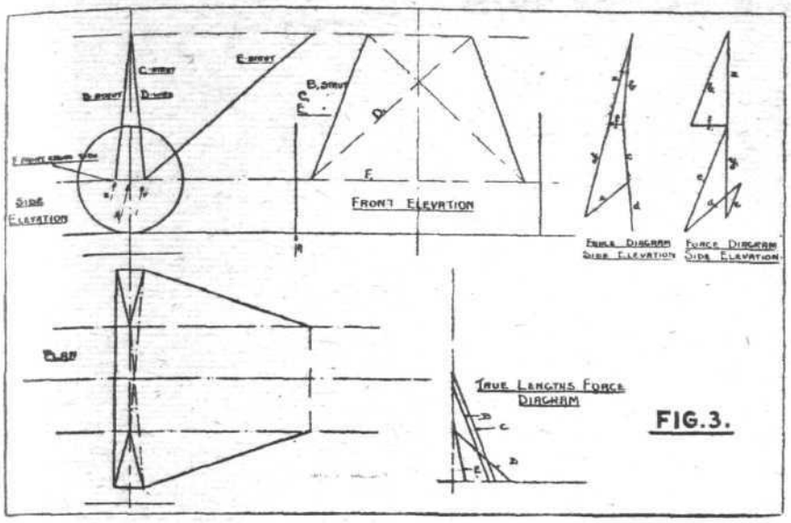


FIG.3.

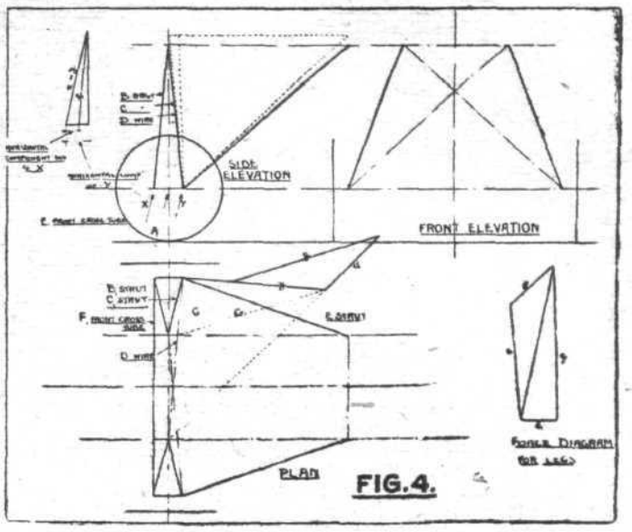


FIG.4.

(Fig. 4). To simplify the problem still further, let the load W, be resolved into its vertical and horizontal components, It will be seen quite readily that the horizontal component will not produce any load in the cross-bracing wire, and so we shall proceed to find the load in the cross-bracing wire due to the vertical component only, and re-introduce the horizontal component later. As in the first example with the simpler undercarriage, a vertical plane including the cross-bracing wire is taken in order to reduce the structure to one imaginary strut, G, and one wire, D, loaded at their intersection point. This is clearly shown in true shape shown dotted in plan, where the triangle of forces y.g.d. is also drawn, giving the load in the cross-bracing wire, D, and imaginary strut, G, shown by *d* and *g* respectively. Now resolve the load, *d*, together with the horizontal component beforementioned, but neglected temporarily, and draw the force diagram shown. Note that *e* and *c* are parallel to E and C from the true shape shown dotted in side elevation. It should also be noted that the horizontal component, *h*, is the sum of horizontal component of Y and that due to force X (see small inset diagram). The compression load in the strut, B, and the tension in the cross-tube, F, can easily be obtained by drawing the true length figure and a triangle of forces. The loads obtained in the several members may now be compared to those found by the previous method, and will be found to agree. It is for the draughtsman or student to decide for himself which of the two methods of solution appeals to him the more, and to use it accordingly.

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ROYAL AERONAUTICAL SOCIETY NOTICES

Lectures.—H.R.H. Prince Albert has graciously consented to preside at the Wilbur Wright Lecture, when Comdr. J. C. Hunsaker, U.S.N. (C.C.), will read a paper on "Naval Architecture in Aeronautics." The lecture will take place at the Central Hall, Westminster, commencing at 8 p.m. on Tuesday evening, June 22, as the date previously fixed is not convenient to His Royal Highness.

Maj.-Gen. E. D. Swinton, C.B., D.S.O., will preside at Capt. P. D. Acland's lecture on "Trans-Continental Flying," on April 14.

Honours.—News has been received with very great pleasure that Maj.-Gen. R. M. Ruck, who was Chairman of the Society for eight years, has been appointed a Knight Commander of the Order of the British Empire.

Council Elections.—The following members have been elected to fill the vacancies on the Council :—

Air-Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., A.F.Ae.S.

Air-Commodore R. K. Bagnall Wild, C.M.G., C.B.E., F.Ae.S.

F. H. Bramwell, F.Ae.S.

Prof. B. Melvill Jones, A.F.Ae.S.

Maj. A. R. Low, F.Ae.S.

A. J. Sutton Pippard, F.Ae.S.

A. V. Roe.

Maj.-Gen. Sir R. M. Ruck, K.B.E., C.B., C.M.G.

Maj. H. E. Wimperis, O.B.E., F.Ae.S.

Brig.-Gen. J. G. Weir, C.M.G., F.Ae.S.

Increase of Subscriptions.—

Grade	Entrance Fee	Subscriptions. Elected to the Society in any grade prior to June 1, 1920.	Elected subsequent to June 1, 1920.
	£ s. d.	£ s. d.	£ s. d.
Fellow	5 5 0	5 5 0	6 6 0
Associate Fellow ..	3 3 0	3 10 0	4 4 0
Student	—	1 1 0	1 1 0
Member	1 1 0	3 3 0	4 4 0
Associate Member	—	1 10 0	2 2 0
Founder Member ..	—	1 10 0	2 2 0
Foreign Member ..	—	1 10 0	2 2 0

Educational Lectures.—Arrangements have been made for the delivery under the auspices of the Society of a series of six lectures on "The Selection and Treatment of Special Materials used in Aircraft," to the Students of Sheffield University, commencing in October. The Chairman, Air-Commodore R. K. Bagnall Wild, will inaugurate the series.

Aerial League.—An invitation has been received from the Aerial League to nominate two representatives of the Society, one of whom shall be the Chairman, *ex-officio*, to the re-constituted Committee of the League. This invitation has been accepted.

Representation on Other Bodies.—In response to an invitation from the Air Ministry, Mr. Alec Ogilvie, Fellow, has been nominated to represent the Society on the new Aeronautical Research Committee, which is taking the place of the Advisory Committee on Aeronautics. Dr. R. Mullineux Walmsley has been similarly nominated to the Advisory Committee on Aeronautical Education.

W. LOCKWOOD MARSH,
Secretary.

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CAMBRIDGE UNIVERSITY AERONAUTICAL SOCIETY

OWING to the kindness of the Director of Research, R.A.F., and the Superintendent of the Royal Aircraft Establishment, 34 members of the Society visited the R.A.E., South Farnborough, on March 18 and 19. On arrival (Thursday evening) they were welcomed by the Superintendent, and later attended the lecture of Professor Coker on his photo-elastic method of measuring stresses in materials.

On Friday the party, divided into four groups, went over the Establishment. During the morning the programme included full scale aerodynamic experiments, propeller manufacture, covering and erecting shops, wind channels and whirling arm, and lastly, the mechanical and structural tests. After lunch the physics research, instruments and engine research departments were visited.

AIRISMS FROM THE FOUR WINDS

WHAT a game the Germans appear to be playing with the Allies! And how about their Lager beer Sinn Feiner gun-running stunt? They're fooling us now just as they did in the years before the War with their lying soporific all-out-for-Peace coup. What about all the present internal trouble in the land of the Huns? Is it real or is it just for dust in the eyes of the Allies, at the moment when the Germans are called upon to finally close down on the peace terms. Looks like it anyway, having regard to the disclosures as to those 2,000 three-inch field guns and 6,000 aeroplanes intact which have just been found by the Inter-Allied Commission. At the present time the limit for guns in their possession is 204 and *all* aeroplanes should have been handed over. No wonder there is "considerable scepticism in France as to the intentions of the Berlin Government in asking permission to send troops into the neutral and occupied zones." It's just the same old bluff again and presently when all our 'planes, crack flying men and designers will have been scattered to the four winds, our guileless wait and see masters at home will awake to the reality that whilst the Huns have the nucleus of a hefty air fleet, we are again in the cart and will have to resort to all sorts of devices to catch up the dopers, if we are then lucky enough to do so.

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LAST week there was quite a field day at the Fenny Stratford Petty Sessions, Bletchley, when a pilot and an aviation company were up against the authorities in answer to six summonses, the first of the sort under the Air Navigation Act, for divers allegations, to wit: as follows:—

1. Flying a machine not carrying British markings.
2. Flying a machine not certified as air-worthy.
3. Flying machine not inspected on day of flight.
4. Taking passengers up for hire or reward on a machine not licensed for this purpose.
5. Not carrying licence on machine.
6. Flying without being licensed.

No doubt, in time, there may be plenty of these sort of cases, but as a legal "milestone" in aviation, the case should be noted.

A DELICATE SITUATION: *Your own* **passenger freight allotment—and Brown's**

Made in Germany! *Before*—**A correspondent sends us this photograph of a German Fokker biplane which was flown by a Canadian pilot at Shoreham during May of last year**

One of the great points which Mr. Handley Page is, during his visit over yonder, impressing upon our Canadian brethren, is the great need for enterprising municipalities to erect aerodromes.

An intensely interesting little "family gathering" took place last week at Jules' Restaurant when, at the invitation of Mr. Griffith Brewer, a few friends of Mr. Orville Wright got together to greet Mr. V. Stefansson, the Arctic explorer, who had just arrived from a visit at Dayton to Mr. Orville Wright and his sister Miss Katherine Wright. It was a happy experience and opened several of the guest's eyes as to the true and most promising methods for arctic exploration. That Mr. Stefansson's once theories were now proved facts was quite patent, and the mistakes hitherto made by adventurers in the higher regions, of encumbering themselves with vast stores of food for out and home again, has apparently been the one great stumbling block of explorers. Mr. Stefansson's method is the reverse. He just goes out into the unknown with as little as possible, and trusts almost entirely to the guns of the party to supply all the animal food they need from day to day. That it is possible, he has proved by his wonderful deeds. How all this upsetting of theories will affect the use of 'planes in future expeditions we know not. It would appear as if it should rather help their utilisation than otherwise, and we hope, should Mr. Stefansson ever take on another attempt at Pole investigation, he will take into consideration this method of keeping up communication with the outer world during what may well be another three or four years' journey across the great ice-packs. At the little gathering aircraft was not mentioned, although never a man amongst us but was more or less intimately associated with air-work. Which was curious. Did we all forget it when invited to seek for information from the guest of the day or was it a case of dodging the question? "Was there a man afraid, was there a man dismayed?" We wonder! It was a delightful experience to listen to the simple narrative, interspersed with quaint similes, of Mr. Stefansson and but for pressure of appointments, the whole company would gladly have remained on to midnight to have first-hand points upon so fascinating a subject. Mr. Griffith Brewer must have felt a very happy host that day.

In a recent issue of a French contemporary is a photo. of an American pilot flying a Curtiss boat under a bridge at Rio de Janeiro, apparently about twice the width of the Tower Bridge. Under the picture is the somewhat bitter comment that the exhibition of the film showing a French aviator flying under the Arc de Triomphe is still prohibited. But surely there is all the difference between a dangerous attempt to get through a small aperture, with the risk of damaging France's most historic monument, and an ordinary flight along a river rather wider than the Thames below the Tower. We think there should be no two opinions regarding

And after—**When at a height of about 6,000 ft. the upper plane broke away from the machine, leaving the centre section struts and N struts on the** *fuselage* **and lower wing respectively. Needless to say the unfortunate pilot was killed**

aerobatic feats undertaken purely for notoriety, which are likely to end in disaster and therefore are injurious to the progress of aviation.

THE annual meeting of the Royal Aero Club proved to be a very quiet affair, especially as contrasted with the one of a year ago. The attendance was small, which was probably due to the absence of any contest for the election of that half of the committee which retired according to rule. It is to be regretted that more members do not take a personal interest in the affairs of their club and its management.

UNDOUBTEDLY the most interesting announcement made by the Duke of Atholl, who presided, was that regarding the series of aviation meetings arranged for the coming season. Apparently an agreement has been come to between the Club and the proprietors of the London aerodrome at Hendon for a list of flying events, to be held under the auspices of the Club, and public enthusiasm, which was becoming so marked in the last twelve months before the outbreak of the War, should be revived by the fixtures announced. A start is to be made about the end of May with a double circuit of London and Brighton. In June, the race from London to Paris and back, which was so notable a feature of the season of 1914, will again be held, to be followed by the Aerial Derby on July 24th, at the conclusion of the Aero Show. The last of the series of events will be a race from London to Manchester and back, to take place in August.

THE revival of the sporting side of aviation after so long an interval deserves to meet with instant success, and it is now up to the manufacturers to see that it has their practical support. The general public will now have an opportunity of seeing the strides which have been made in the industry since the pre-War days, and if the races are carried out with care, as we have no doubt they will be, and accidents are avoided, they will do much to demonstrate the safety of modern flying and thus encourage its development as a means of transport, as well as encouraging the sporting private owner-pilot, whose numbers at present are extremely small.

BY the way, the term "Aerial Derby" seems to be so badly mis-used to-day as to lose its original meaning altogether. It has been applied to all kinds of flying races, and the Americans have been talking about an "Aerial Derby" across the Pacific, or something of that sort. The first one held was due to the enterprise of Messrs. Grahame-White and Richard T. Gates, who decided to hold a race around London as near as possible to the date of the Derby itself, Epsom being one of the turning points. The reason for the name was appropriate enough, and it is to be hoped the historic significance of this name will not be entirely spoiled by a modern generation of aviators who either have no knowledge or no respect for the old traditions.

THAT aeroplane trip to Paris prize in the Golden Ballot has fallen to the lot of Mr. F. Hugh Barnet, of 51, Westwood Road, Southampton (ticket No. 985,751). He'd better hurry up and get it through before the authorities in charge of our morals (!) decide against its legality. They can't anyway take *that* prize back again, whatever they may try to do with the £1,250 (paper £2,500), the motor car and the £900 pearl necklace. In like manner Wing Commander Fletcher, R.A.F., with his prize of a case of champagne, should have little difficulty in getting clear of any "returns."

Liverpool's Aerodrome Opened

THE Bidston aerodrome, near Liverpool, established by the Great Northern Aerial Syndicate, was opened on March 31 by the Mayor of Birkenhead (Alderman J. H. M'Gaul). At the inaugural luncheon, Mr. W. E. Cooke, managing director, said that the Government should have given facilities to ex-flying officers to purchase machines, even if they did it on the instalment plan. It had been hoped to give an exhibition of flying, but owing to the heavy rain overnight it was decided to postpone this part of the programme.

Landing on a Warship

IN connection with the announcement that aeroplanes had landed successfully on the deck of the aircraft-carrier *Argus* during the cruise of the Atlantic Fleet, it may be recalled that the first pilot to achieve the feat was Squad-Comdr. Edwin H. Dunning, D.S.C., R.N., a son of Sir Edwin Dunning, who landed on the deck of H.M.S. *Furious* while the ship was under way in August, 1917. He received a telegram from the Admiralty conveying their appreciation of his skill, but for obvious reasons the facts could not be made public at the time. A few days later, while engaged in further experiments, he met with an accident and lost his life.

Aerial Photographs of York

AT a special meeting of the York City Council the other day, Alderman J. B. Morrell presented enlargements on a very large scale of two photographs of the city, taken by aviators flying over the city. Alderman Morrell was heartily thanked by the Lord Mayor and Council for the photographs, which the Council hopes to display somewhere easily accessible to the public.

The H. P. Continental Services

ON the Handley Page Continental air services between September 2, 1919 and March 27, 1920, inclusive, 1,140 passengers and 61,807 lbs. of freight have been carried over a distance of 84,089 miles.

Capt. Matthews at Bangkok

ON April 6, at noon, Capt. Matthews on his Sopwith "Wallaby," arrived at Bangkok, having flown from Rangoon in less than five hours' flying time.

Lieuts. Parer and Macintosh, on their De H. 9, arrived at Rangoon on April 2. They were delayed by a forced landing on the banks of the Irrawaddy, and had to seek the aid of the villagers to cut away the dense vegetation of the jungle to enable the plane to rise. On April 4 they reached Moulmein (Burma), but in landing on uneven ground the landing chassis of the machine was damaged.

Sir Ross Smith Flies to Melbourne

CAPT. SIR ROSS SMITH is continuing to rouse enthusiasm for aviation in Australia by flying, and on April 5 he flew the 400 miles from Adelaide to Melbourne in 5 hours 45 mins. For his lecture tour Sir Ross Smith is arranging an 8,000-ft. cinematograph film, the first part of which is devoted to Australian scenes and the rest to pictures of his flight.

A New Aerodrome for Paris

IN view of the probable increase of air traffic, the building of a new aerodrome, to serve as a terminus for Paris, is being considered. In the meantime, the French Customs authorities are proposing to make the aerodrome at Saint Inglevert a customs collecting station for the London-Paris service, so as to relieve Le Bourget. Arrangements have been made at St. Inglevert for day landings and a lighthouse has been placed in position but is not yet in operation. The installation also includes two hangars, oil and petrol stores, a repair shop and a wireless station.

A French Airship over Spain

IT is reported from Barcelona that a French dirigible, 125 metres in length, with 18 passengers on board cruised over the town on March 27.

French Air Post to Morocco

A NEW aerial line between France and Morocco has been inaugurated. The service is a regular one, two aeroplanes leaving Toulon each day, and two others leaving Casablanca in the opposite direction.

An Aerial Mail for Spain

ARRANGEMENTS have been made by the Spanish Government by which the French machines on the Frejus-Toulouse-Rabat air service will carry Spanish mails between Barcelona, Alicante and Malaga. This service, the first of its kind in Spain, was officially inaugurated at Alicante on April 1, in the presence of the French Consul and a large number of officials of the Spanish postal service and the municipal authorities.

A Barcelona-Majorca Service

THERE is now an aerial service between Barcelona and the Balearic Isles, but it will not be regularly running before the end of May. It is proposed that one seaplane will leave Barcelona at 10.30 a.m., while another will leave Palma (Majorca) at 3 p.m. For a single journey the fare is to be 100 pesetas (£4), while the letter rates will range from 50 centesimos to 1 peseta (5*d.* to 10*d.*) according to the Government subsidy. A hangar will be constructed at Palma, and both at Barcelona and Soller a fast motor boat will be stationed to come to the rescue of the seaplanes in case of need.

The Rome to Tokyo Flight

THE last squadron of S.V.A. aeroplanes flying to Tokyo has had to split up.

Capt. Gordesco and Lieut. Meozzi left Adalia on March 29th for Aleppo, and Capt. Ranza and Lieut. Marzari were to follow when their machines had been overhauled.

Lieut. Ferrarin damaged the under carriage of his machine in landing after a trial flight on April 4 and he will be delayed at Rangoon for five or six days.

FLIGHT

AVIATION IN PARLIAMENT

Mess Kit

MR. RAPER asked the Under-Secretary of State to the Air Ministry if he will state why it is laid down in the sealed pattern for the Air Force mess kit that pilots' and/or observers' wings may not be worn?

Major Tryon: The Royal Air Force mess uniform was carefully considered by a Committee of Royal Air Force officers. Their recommendations were approved by the Air Council.

Mr. Raper: Is it not the fact that this rule was brought in by staff officers who have not the right to wear wings? Surely my right hon. friend is aware that all pilots are proud of that special distinction, and that this is causing very great dissatisfaction?

Major Tryon: I am not aware that there is dissatisfaction. I have enquired, and I understand that all Air Force officers with the exception of staff officers will wear wings.

Mr. Raper: Will the hon. and gallant member see that in future the observer and the pilot wear their wings?

Major Tryon: They will wear their wings when in regular uniform. The Committee did not think it desirable to wear wings in the mess uniform.

Mr. Raper: Will the hon. and gallant gentleman enquire why?

Major Tryon: Because the officers who were asked to enquire into the matter thought that that was the best plan. Obviously, opinions differ.

Officers Employed by Air Ministry

MR. RAPER asked the Under-Secretary of State to the Air Ministry how many officers are employed in the Air Ministry; how many of them are qualified pilots and/or observers; and whether all the officers attached to the Air Ministry who wear pilots' wings have done not less than 20 hours' solo on service-type machines, and also passed all the usual war tests?

Major Tryon: The number of officers of all ranks and classifications in the Air Ministry is 185; this figure includes officers engaged in the Departments of Civil Aviation, Supply and Research, Medical Administration and Stores. Of the total, 82 are qualified pilots or observers. All officers who wear pilots' wings passed all the flying and war tests qualifying them for service in the field at the time at which they earned their wings with the exception of a few officers whose duties were at the time confined to specialist work, and who were granted their wings after passing flying tests. It is unlikely that any individual officer has passed all war tests, as these were essentially specialist tests designed to qualify officers for the particular type of duty for which they were selected.

Aeroplane Launching and Landing Platforms on Ships

CAPT. W. BENN, on March 14, asked the Under-Secretary of State for Air how many ships capable of launching aeroplanes from the deck are in commission; how many have platforms on which aeroplanes can land; and under which Ministry are such ships?

Mr. Long: I have been asked to reply to this question. There are ten ships in commission in which provision is made for launching (*i.e.*, flying off) aeroplanes from a deck or platform, apart from battleships and battle-cruisers which were mentioned in answer to the hon. and gallant member's question of March 11. All ten vessels are in commission under the Admiralty. Only one of these vessels has a platform on which an aeroplane can alight.

Seaplane Carriers

CAPT. W. BENN asked the Under-Secretary of State for Air how many converted seaplane carriers are still in commission; and under which Ministry?

Mr. Long: I have been asked to answer this question. Three converted seaplane carriers are still in commission under the Admiralty.

Flying from Ship's Deck

CAPT. W. BENN asked the Under-Secretary of State for Air who is responsible for the training of pilots of machines to fly from ships' decks; and where and how is practice secured?

Major Tryon: Responsibility for this training rests with the Air Officer Commanding the Coastal Area of the Royal Air Force. Practice is obtained, first of all, at Leuchars Aerodrome. When the pilots are sufficiently practised, they are embarked on His Majesty's ship *Argus*, and learn to fly off the deck, landing at Leuchars. Finally, when they are considered sufficiently proficient, they are taught landing on the deck of the *Argus*.

Air Raid Compensation (Leaseholders)

MR. G. W. H. JONES asked the President of the Board of Trade whether the Air Raid Compensation Committee limit the compensation payable to owners of leases containing a repairing covenant to the market value of their interest in such leases; whether he is aware that, as a consequence, the amount of compensation is sometimes far less than the actual loss sustained by such owners; whether his attention has been called to the case of Mrs. Gamon, the owner of 109, Packington Street, London, to whom the Committee, owing to the said limitation, awarded £170 for the balance of admitted actual damage of £460, and who is, therefore, personally responsible for the difference of £290; and whether, in the case of Mrs. Gamon and persons similarly situated, he will take steps to ensure that compensation shall be paid by the Committee on an indemnity basis?

Mr. Bridgeman: It was decided that the Air Raid Compensation Scheme did not extend to cover loss arising out of liabilities incurred by any person in respect of the property of others as, for example, liabilities incurred under the covenants of a lease. In the case of Mrs. Gamon the total agreed amount of the damage to the building of 109, Packington Street, Islington, was £860. Mrs. Gamon had insured the property for £400 under the Government insurance scheme, and was paid £400. She then applied under the Air Raid Compensation Scheme, and, the value of her leasehold interest at the time of the damage being £170, that amount was paid. The Air Raid Compensation Committee stated that they were prepared to consider a claim from the freeholders in respect of their interest, as owners, in the property, provided that they were qualified, under the conditions of the scheme, to apply for compensation, but no application was made. I am unable to agree that any further compensation under the scheme is due to Mrs. Gamon.

Surplus Government Stores (Aircraft Material)

MR. WILLIAM CARTER asked the Under-Secretary of State to the Air Ministry whether all the Government's surplus aircraft material has now been sold to the Aircraft Disposal Company, Ltd.; what was the price paid by the buying companies; whether there was a valuation of the material before it was sold; and, if so, what was the estimated value?

The Financial Secretary to the Ministry of Munitions (Mr. James Hope): I have been asked to answer this question. All the Government surplus aircraft has been sold, the price being £1,000,000, plus 50 per cent. of the net profits realised by the purchaser on the sale of such material. No valuation in the ordinary sense of the term is possible, as the items involved have no definite ascertainable market value. The total stock of aircraft, which has already become or will become surplus, is sufficient to meet several times over the potential world-demand for the next few years.

Bircham Newton Aerodrome

IN the discussion on the Air Estimates, on March 23rd, Mr. Jodrell drew attention to the conditions at the Bircham Newton Aerodrome in Norfolk. Major Tryon said the buildings at the aerodrome were temporary ones erected during the War, and they were doing all they could to improve them.

Ministry of Transport and Aviation

IN the debate on the Consolidated Fund Bill, on March 24th, General Seely drew attention to the extraordinary position in which air transport had fallen. Alone among the nations we were neglecting air transport and it was disappearing. He appealed to the Minister of Transport to bend his mind to this problem, and although air matters were no under his direct control, air transport must be as all transport questions were.

Sir E. Geddes said he would rather the air remained where it was. As Minister of Transport, he could give no hope to General Seely, but he had no doubt those who were responsible for air transport would take note of what he had said.

Civil Aviation

LIEUT.-COL. MALONE, on March 30, asked the Under-Secretary of State to the Air Ministry if he is yet in a position to make a statement concerning the findings of the Advisory Committee which is discussing the question of civil aviation?

The Under-Secretary of State for Air (Maj. Tryon): As I explained in my reply on the 17th of this month to my hon. and gallant friend, the member for Norfolk, E., the recommendations of this Committee on the subject of Imperial air routes were published as Command Paper 449. A further Report of the same Committee on certain other questions is expected very shortly.

Lieut.-Col. Malone: May I ask whether, pending the Report of this Commission, any steps are being taken to transform the big factories into the purposes of other industries?

Maj. Tryon: The Committee referred to by my hon. and gallant friend is sitting at the present moment, and I very much hope they will come to a conclusion to-day, in which case it would obviously be wrong for me to make any premature announcement.

Mr. Pemberton Billing: Is it or is it not the intention of the Government to subsidise civil aviation? Is the right hon. gentleman aware that unless he does so the development of civil aviation will be arrested, and it will die?

Maj. Tryon: As we expect the Report of the Committee it would be unfair to come to a decision before we have got their report.

Mess Kit

MR. RAPER asked the Under-Secretary of State to the Air Ministry how many hours solo flying was accomplished by each of the officers at present serving in the Air Ministry who were granted their wings without passing all the usual war tests; and what test officers now have to pass in order to qualify them for wearing pilots' and/or observers' wings?

Maj. Tryon: I am not prepared to make a personal inquiry from each of the officers in question, and there is no other method of ascertaining how many hours solo flying each officer has carried out. With regard to the second part of the question, the tests at present qualifying for the wearing of pilots' wings have been published in Air Ministry Weekly Orders. The minimum for solo flying on the qualifying type of machine is five hours. Observers' wings were granted to officers who saw service as observers during the War. Officers can no longer qualify to wear these badges.

The Mess Kit Committee

MR. RAPER asked the Under-Secretary of State to the Air Ministry the names of all the members of the Committee which recommended that pilots' and/or observers' wings should not be worn on the Air Force mess kit, which recommendation was approved by the Air Council; and whether all the members serving on this Committee had themselves at that time passed all the usual tests to justify their wearing pilots' and/or observers' wings on their service uniforms?

Maj. Tryon: The members of this Committee were:—Air Commodore Lambe, C.B., C.M.G., D.S.O.; Air Commodore Longcroft, C.M.G., D.S.O., A.P.C.; Group Capt. Longmore, D.S.O. All these officers are entitled to wear wings. They qualified respectively in 1915, 1912 and 1911. My hon. friend will realise that when he suggested that the members of this Committee had not themselves the right to wear wings he was wrong both as to the records of these three officers and as to the motives which led to their decision.

Cramlington Aerodrome, Northumberland

SIR FRANCIS BLAKE asked the Under-Secretary of State to the Air Ministry whether he can say what is going to be done with the semi-completed aerodrome at Cramlington, Northumberland: what number of houses are already erected in connection with it; and whether, if it is not required for the Royal Air Force, he will consider the desirability of offering these houses to the local authorities for the use of the civil population?

Maj. Tryon: The aerodrome was handed over to the Disposal Board on the 12th of this month, and I must refer my hon. friend to the Parliamentary Secretary to the Ministry of Munitions with regard to the first and third parts of his question. With regard to the second part no houses have been built; but hutted quarters have been erected, capable of accommodating approximately 60 officers, 220 men, and 130 women.

Photographic Survey of United Kingdom

VISCOUNT CURZON asked the Under-Secretary of State to the Air Ministry whether any steps have been taken or are in contemplation to make an aerial photographic survey of the whole or, at any rate, the more important parts of the United Kingdom?

The Parliamentary Secretary to the Ministry of Agriculture (Sir Arthur Boscawan): The United Kingdom is the most completely and accurately mapped country in the world. Maps exist on all scales from 25 ins. to 1 mile to 1 in. to 1 mile, and smaller scales, and are periodically revised. The Ordnance Survey is watching the development of aerial photographic methods, but, at present, these methods are far less accurate and more expensive than those actually in use by the Department. Future possibilities are, however, not being lost sight of.

R.A.F. Cadets' Outfits

Sir W. BULL, on March 31, asked the Under-Secretary of State for Air if, in view of the great dissatisfaction expressed by tailors and traders generally as to non-receipt by them of a settlement of their claims, through the Army agents and bankers, against British and Overseas cadets, whose grants were to be applied against their liabilities for kit supplied, he will state whether outstanding liabilities will now be met within a reasonable time, taking into consideration the fact that authorisation was given as long ago as January, 1919?

Maj. Tryon: The settlement of the claims in question is primarily a matter between the tailor or outfitter and the cadets themselves, to whom he has supplied uniform. The position of the Air Ministry is simply that it has authorised certain allowances to cadets towards meeting the cost of outfit. The procedure is that unless he settles the account himself and draws the allowance from the Air Force agents, the cadet gives an authority either to the outfitter or to the agents for the allowance to be applied in settlement of the account. Any delay in this settlement is thus not a matter within the control of the Air Ministry.

THE ROYAL AIR FORCE

London Gazette, March 23

Flying Branch

Sec. Lieuts. to be Lieuts.—H. J. Gemmel (since granted Short Service commn.). J. L. Wight (since demobilised); Mar. 26, 1919. R. A. Rowberry; May 1, 1919.

Pilot Officers to be Flying Officers.—E. W. Reis; Nov. 9, 1919 (since relinquished commn.). W. R. Moscrip; Jan. 26.

Pilot Officers (O.) to be Observer Officers.—W. R. Heywood, F. L. Kingham; Oct. 1, 1919. L. T. Kerry; Dec. 24, 1919. A. B. Ball, J. B. Prouse; Jan. 27. B. H. Du Fue; Feb. 23.

Sec. Lieut. E. J. Ralli (late Gen. List, R.F.C., on prob.) is confirmed in rank as Sec. Lieut. (O.); Aug. 8, 1918 (since deceased).

The following relinquish their temp. R.A.F. commns. on return to Army duty.—Lieut. (Hon. Capt.) J. G. Stewart, M.C. (Capt., N. Zealand, A.S.C.); Feb. 3, 1919. Sec. Lieut. (Hon. Lieut.) G. L. Warner (Lieut., Quebec R.); Mar. 24, 1919. Lieut. J. B. Harvey (Lieut. C. Ont. R.); May 28, 1919.

(Then follow the names of 40 officers who are transfd. to the Unemployed List under various dates.)

Capt. Lord F. D. Doune, M.C. (Sco. Horse Yeo. (T.F.)), relinquishes his commn. on account of ill-health, contracted on active service, and is permitted to retain his rank; Mar. 10.

The following Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank.—W. M. Anderson (R. Suss R. (T.F.)), (contracted on active service); April 18, 1919. (Substituted for *Gazette*, Mar. 9). F. Whitburn (caused by wounds); Mar. 17. J. M. Dowsett (contracted on active service); Mar. 22. Lieut. D. B. Richardson (Yorks. R.) relinquishes his commn. on account of ill-health, contracted on active service; Mar. 13.

The following Sec. Lieuts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank.—G. R. Moffoot; Mar. 15. M. E. Atkey; Mar. 16.

Administrative Branch

Lieuts. to be acting Capts. whilst employed as Capts.—W. E. Fox; Oct. 26, 1918, to April 30, 1919. W. Pilkington, M.C.; Jan. 1, 1919, to Apr. 30, 1919. Lieut. W. E. Fox is graded for purposes of pay and allowances as Capt. whilst employed as Capt.; May 1, 1919.

Flying Officer C. L. P. Mullany to be acting Flight-Lieut., whilst employed as Flight-Lieut., without pay and allowances of that rank; Mar. 10.

Sec. Lieuts. to be Lieuts.—(Acting Capt.) W. A. Glasper, and to retain the acting rank of Capt. whilst employed as Capt; Oct. 26, 1918. L. A. T. Power; Apr. 19, 1919 (since demobilised).

Pilot Officers to be Flying Officers.—(Acting Flying Officer) J. L. Saxton (since demobilised). J. B. West; Oct. 1, 1919. W. Knight; Oct. 29, 1919. C. D. Insall; Feb. 21.

(Then follow the names of 9 officers who are transfd. to the Unemployed List under various dates.)

Sec. Lieut. F. G. L. Heyes is antedated in his appointment as Sec. Lieut. June 3, 1919.

Technical Branch.

Lieut. S. Field to be Lieut., Grade (B.), from (Ad.); Oct. 26, 1918 (substituted for *Gazette*, Nov. 22, 1918. Flying Officer A. G. Stradling to be Flying Officer, Grade (B.), from (S.O.); Oct. 18, 1919 (substituted for *Gazette*, Dec. 9, 1919. Sec. Lieut. M. F. Tomkins to be Lieut., Grade (A.); June 1, 1919 (since granted a Short Service commn.). Pilot Officer F. Fazey to be Flying Officer, Grade (A.); Oct. 1, 1919. Sec. Lieut. H. Stocks to be Lieut., Grade (B.); July 15, 1919.

Pilot Officers to be Flying Officers, Grade (B.).—E. R. Hockaday, A. P. Marchant, M.B.E., D.S.M.; Oct. 1, 1919. C. P. Brown; Jan. 3.

Sec. Lieuts. to be Lieuts., without pay and allowances of that rank.—(Hon. Lieut.) C. V. Jameson (Hon. Lieut.), L. Watman (since demobilised); April 2, 1918. (Hon. Lieut.) N. Whitley; June 9, 1918 (since demobilised). (Hon. Lieut.) G. Le M. Mander; Dec. 24, 1918 (since demobilised). H. E. H. Dering; Mar. 1, 1919. F. C. Griffin; Mar. 3, 1919. J. T. C. Lovell; May 26, 1919. H. C. Dalglish; July 10, 1919.

Pilot Officers to be Flying Officers, without pay and allowanzes of that rank.—J. F. Armitt, F. W. Boggis, E. S. Bullen, H. A. Castaldini, J. Chidgey, J. Coles, W. Gill, L. E. Goodman, A. E. Groom, W. H. Jinman, C. B. McIntyre, F. O'Donnell (since demobilised), J. M. Wyer; Oct. 1, 1919.

Flight-Lieut. E. McEvoy (Lieut., Oxf. and Bucks. L.I.) relinquishes his temp. R.A.F. commn. on return to Army duty; Mar. 23.

(Then follow the names of 10 officers who are transfd. to the Unemployed List under various dates.)

Motor Boat Branch

Sec. Lieut. Hon. Lieut.) D. C. Ellis; Mar. 12.

Medical Branch

(Two officers transfd. to the Unemployed List.)

Capt. J. J. Sinclair relinquishes his commn. on account of ill-health, contracted on active service, and is permitted to retain his rank; Mar. 10.

Memoranda

The following Proby. Flight Officers are granted hon. commns. as Sec. Lieuts.:—A. E. Wilson; Jan. 6, 1919. V. E. Watson; Jan. 31, 1919. K. W. Marriner; Mar. 10, 1919. C. F. Walker; Mar. 14, 1919. H. P. Smith; Apr. 10, 1919. R. C. Rosser; June 11, 1919.

(Then follow the names of 34 Cadets granted hon. commns., and 510 Canadian Cadets granted hon. commns. as Sec. Lieuts.)

London Gazette, March 26

The notification in *Gazette* of Aug. 1, 1919, appointing Maj. C. E. Bryant, D.S.O. (A.), to a permanent commn. is cancelled.

Short Service Commissions

Flying Officer G. R. St. C. Gwynne-Timothy to take rank and precedence as if his appointment as Flying Officer bore date Jan. 16.

Flying Branch

The following relinquish their temporary R.A.F. commns. on reversion to I.A.R.O.:—Lieut. H. F. Knight (Lieut., I.A.R.O.); Feb. 22, 1919. Flying Officer H. S. Green (Lieut., I.A.R.O.); Jan. 6.

The following relinquish their temporary R.A.F. commns. on return to Army duty:—Flying Officer E. H. B. Burkitt (Lieut., Manch. R.); March 16. Pilot Officer H. E. Power (Lieut., E. Surr. R.); March 17. Transfd. to the Unemployed List:—Lieut. (actg. Capt.) (Hon. Maj.) J. A. C. Wright; Jan. 12, 1919. Sec. Lieut. N. P. Longden; Jan. 20, 1919. Lieut. (actg. Capt.) L. M. Copeland; Jan. 21, 1919. Sec. Lieut. (Hon. Capt.) W. L. Hemus; Jan. 22, 1919. Lieut. E. K. Robins; Jan. 24, 1919. Lieut. W. H. Swinford; Jan. 31, 1919. Sec. Lieut. (Hon. Lieut.) G. L. Parkinson, M.C.; Feb. 1, 1919. Sec. Lieut. C. F. J. Lisle; Feb. 5, 1919. Capt. E. E. Barnett; Feb. 18, 1919 (substituted for notification in *Gazette* of March 21, 1919, wherein this officer was shown as Capt. E. E. Bennett); Lieut. A. O. Bigg-Wither; Feb. 22, 1919. Lieut. G. H. Bennett; March 7, 1919. Lieut. G. D. Wilson; March 8, 1919. Sec. Lieut. F. Baylis; March 22, 1919. Lieut. W. G. Savage; April 15, 1919. Sec. Lieut. E. G. Walker; May 11, 1919. Sec. Lieut. J. P. Gilbert; May 21, 1919 (substituted for notification in *Gazette* of Oct. 21, 1919. Sec. Lieut. E. E. Bennett; June 1, 1919. Lieut. A. C. Thornton; June 16, 1919 (substituted for notification in *Gazette* of July 29, 1919. Sec. Lieut. J. Chacksfield; June 25, 1919. Lieut. H. E. Rydon; June 28, 1919. Sec. Lieut. L. Thompson; July 13, 1919 (substituted for notification in *Gazette* of July 29, 1919. Lieut. D. W. Meredith; July 29, 1919. Sec. Lieut. P. D. Anderson; Aug. 9, 1919. Lieut. C. J. Thomson; Aug. 11, 1919. Lieut. R. A. Arnott; Aug. 26, 1919. Sec. Lieut. H. O. Knapp; Aug. 29, 1919. Sec. Lieut. E. H. Thistlethwaite; Sept. 28, 1919. Sec. Lieut. T. P. O'Donnell; Oct. 11, 1919. Lieut. J. E. Burke; Oct. 22, 1919. Lieut. W. J. Brown; Nov. 18, 1919. Lieut. R. F. Saunders; Nov. 29, 1919. Sec. Lieut. H. V. Feather, Lieut. R. C. Steele, D.S.O.; March 6. Lieut. W. S. Reid; March 9. Capt. N. G. Stewart-Dawson, D.S.O., D.S.C.; March 10. Sec. Lieut. W. S. J. Walne; March 15. Lieut. W. P. Bingham, Maj. J. B. Quested, M.C., Lieut. B. E. S. Smith, Sec. Lieut. A. L. Watts; March 18.

The following Lieuts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank:—H. E. Thomson; March 6. S. E. Dreschfeld, A.F.C.; March 19.

The Christian names of Alexander Anderson McConnell, M.C. (Temp. Lieut., Dur. L.I.) are as now described, and not as stated in *Gazette* of April 8, 1919 (page 4573).

The notification in *Gazette* of July 29, 1919, concerning Sec. Lieut. W. R. Thompson is cancelled (notification in *Gazette* of Sept. 30, 1919, to stand).

(Then follow the names of 19 officers who are transfd. to the Unemployed List under various dates.)

Sec. Lieut. J. W. Murdoch; March 21. Lieut. W. Pritchard, M.C., is antedated in his appointment as Lieut.; Oct. 10, 1918.

Technical Branch

Capt. W. E. Grey (Capt., Lon. R. (T.F.)) relinquishes his temp. R.A.F. common. on return to Army duty; July 1, 1919.

(Then follow the names of 12 officers who are transfd. to the Unemployed List under various dates.)

Lieut. J. Roberts retires on ret. pay, and is permitted to retain his rank; Jan. 1 (substituted for notification in *Gazette* Feb. 6).

The rank of Pilot Officer H. R. Powell is as now described, and not as stated in *Gazette* Feb. 17.

The notifications in *Gazettes* Feb. 13 concerning Sec. Lieut. W. Gill; March 5, Lieut. N. W. Wale; March 9, Lieut. L. F. Buckingham (*Gazette* Feb. 10); March 12, Sec Lieut. W. F. Bate, are cancelled.

Medical Branch

(Two officers transferred to Unemployed List.)

The surname of Flying Officer J. C. Smyth is as now described, and not as stated in the *Gazette* of Aug. 19, 1919.

Memoranda

Lieut. J. E. Gurdon, D.F.C. (late actg. Capt., R.A.F.), is permitted to retain the rank of Capt.

The following Probationary Flight Officers are granted temp. commns. as Sec. Lieuts., with effect from Feb. 15, 1919, and relinquish such commns., with permission to retain the rank from the day following termination of the standardised voyage in the case of those claiming immediate repatriation, and from the date of demobilisation in all other cases:—H. W. Bender, F. P. Brennan, E. J. Bondreau, T. L Blakeney, E. Claydon, J. G. P. Cleland, A. V. Davis, J. G. Davidson, C. W. Holland, S. P. Inman, T. R. Lawrence, H. N. Martin, S. W. Stewart.

(Then follow the names of three Overseas Cadets granted temp. commns. and 360 Canadian Cadets granted hon. commns. as Sec. Lieuts., also 39 Cadets granted hon. commns. as Sec. Lieuts.).

Wing-Comdr. G. W. P. Dawes, D.S.O., A.F.C. (Maj., Brev. Lieut.-Col.) (R. Berks. R.), relinquishes his temp. R.A.F. commn. on return to Army duty; March 17.

(Then follow the names of four officers who are transfd. to the Unemployed List under various dates).

London Gazette, March 30

The following officers have been granted short-service commns. in the ranks stated. Except where otherwise stated the commns. will have effect from March 30, and the officers will retain their seniority in the substantive rank last held by them prior to the grant of the short-service commn.

In the case of officers now gazetted Flying Officer, or Observer Officer, from Pilot Officer, seniority will date from the date of *Gazette*:—

Squadron Leader.—W. S. Douglas, M.C., D.F.C. (A.), (with effect from March 25).

Flight Lieutenant.—W. E. G. Beauforte-Greenwood (T.).

Flying Officers.—G. D. Ashby (S.O.), J. S. J. Craigen (A.) (with effect from March 26), E. W. Logsdail (A. and S.), H. J. Saker (A.), F. W. Sinclair, D.F.C. (A.), E. Wormell (A.).

Flying Officers (from Pilot Officers).—J. Holthouse (A.), G. E. Newton (A.), J. T. O'Brien-Saint (A.), E. R. Stafford (A. and S.).

The notifications appearing in *Gazettes* of the dates indicated below, appointing the following officers to short-service commns., are cancelled:—Flight-Lieut. H. P. Rushforth, M.C. (A.), Flying Officer R. M. Johnson (A. and S.); Oct. 24, 1919. Obs. Officer J. S. C. Robinson; Nov. 28, 1919. Flying Officer S. W. Bird (A.), Flying Officer H. S. Hobby, M.C. (A.); Dec. 5, 1919. Flying Officer E. G. Baxter (A.); Jan. 20.

The classification of Flying Officer N. P. Dixon, A.F.C. (A. and S.), is as now described, not (A.) as stated in *Gazette* of Jan. 20.

Permanent Commissions

Flying Officer T. C. Traill, D.F.C. (A.), is granted a permanent commn. in the rank stated, with effect from Aug. 1, 1919.

The notification in *Gazette* of Nov. 25, 1919, appointing Flight-Lieut. D. F. Massy (S.O.) to a permanent commn. is cancelled.

The notification in *Gazette* of Sept. 26, 1919, appointing Flight-Lieut. H. L. Rutty (Airship) to a permanent commn. is cancelled.

Sqdn. Leader H. J. Newton-Clare, O.B.E. (T.), resigns his permanent commn., with effect from March 31.

The notification in *Gazette* of Aug. 1, 1919, appointing Lieut. T. G. Poland, M.C. (A.), to a permanent commn. is cancelled (substituted for *Gazette* notice of March 9).

Wing Comdr. A. H. Measures, O.B.E., resigns his permanent commn. with effect from March 31, and is granted a permanent commn. in the rank

of Sqdn. Leader, with effect from April 1 (to take precedence immediately below Sqdn. Leader J. W. Cruikshank, O.B.E.).

The names of Capt. R. Graham, D.S.O., D.S.C.. D.F.C. (S.) (*Gazette*, Aug. 1, 1919), Lieut. A. B. Wiggin (*Gazette*, Aug. 1, 1919), Maj. T. F. Bullen, O.B.E. (T.) (*Gazette*, Aug. 1, 1919), Capt. L. D. D. McKean (A.) (*Gazette*, Aug. 1, 1919). Capt. L. J. St. G. Bayly, M.C. (A.) (*Gazette*, Aug. 1, 1919), Maj. C. F. A. Portal, D.S.O., M.C. (A.) (*Gazette*, Aug. 1, 1919), are as now stated.

Flying Branch

J. J. Yates (Lieut., late Gen. List, R.F.C.) to be Lieut. (A.); May 10, 1918 (since demobilised).

Second Lieutenants to be Lieutenants :—T. Whitaker; Oct. 13, 1918 (since re-classified) (Ad.) (substituted for notification in *Gazette* July 29, 1919. L. G. Warren; July 24, 1919 (since demobilised). F. G. Clarkson; Aug. 7, 1919 (since demobilised).

Pilot Officer F. G. R. V. Bramble (O.) to be Obs. Officer; Feb. 22 (since demobilised).

The following Prob. Flight Officers (late R.N.A.S.) are granted temp. commns. as Sec. Lieuts. (A.) :—W. H. Temple; April 1, 1918. J. O. Wood; July 22, 1918.

(Then follow the names of 33 officers who are transfd. to the Unemployed List under various dates.)

Sec. Lieut. (Hon. Lieut.) A. Westall (Lieut., Manch. R. (T.F.) relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain the rank of Lieut.; March 19.

The notifications in *Gazettes* Oct. 3, 1919, concerning Lieut. W. G. Woods; *Gazette*, Feb. 17, Sec. Lieut. E. Cotton; *Gazette*, July 22, 1919, Sec. Lieut. G. C. Jenkins (*Gazette*, Aug. 5, 1919, to stand) are cancelled.

Administrative Branch

Second Lieutenants to be Lieutenants :—(Hon. Capt.) (actg. Maj.) C. Harvey; April 2, 1918, and to retain his hon. and actg. rank; (Hon. Lieut.) W. H. Hills; July 27, 1918 (*Gazette* Oct. 3, 1919, to stand). R. C. Ryan; Oct. 14, 1918 (since demobilised).

Flying Officer (Hon. Flight-Lieut.) A. M. Watson, M.B.E. (Qrmr. Capt.), Shrops. L.I.), relinquishes his temp. R.A.F. commn. on return to Army duty; March 21.

(Then follow the names of nine officers who are transfd. to the Unemployed List under various dates.)

Lieut. A. R. Harris relinquishes his commn.; Nov. 22, 1910.

Technical Branch

E. R. Wood (Lieut., Nova Sco. R.) is granted a temp. commn. as Lieut., Grade (B.); July 9, 1918 (substituted for *Gazettes* Sept. 6, 1918, and March 21, 1919). Sec. Lieut. B. P. K. Walsh to be Lieut., Grade (A.); May 16, 1919 (since demobilised) (substituted for notification in *Gazette* July 29, 1919). The following Sec. Lieuts. to be Lieuts., Grade (B.): G. E. Lane; April 2 1918 (substituted for notification in *Gazette* Jan. 3, 1919. W. Doughton. Feb. 24, 1919 (since demobilised). The following Pilots Officers to be Flying Officers Grade (A.): J. A. Joyce (substituted for notification in *Gazette* Feb. 17). A. V. Pepperell, F. Polley; Oct. 1, 1919. V. W. G. Day; March 1. The following Sec. Lieuts. to be Lieuts., without pay and allowances of that rank: R. E. F. L. Bristow; Oct. 26, 1918 (since demobilised) R. R. Wilson; June 28, 1919 (since demobilised). The following Pilot Officers to be Flying Officers without pay and allowances of that rank: G. Brooks, S. F. Cole, S. R. Gellett, J. T. Gibson, F. J. Knowler, A. E. Platford; Oct. 1, 1919. W. G. Fairley; Dec. 24, 1919 (since demobilised).

(Then follow the names of 11 officers who are transfd. to the Unemployed List under various dates.)

Sec. Lieut. (Hon. Lieut.) S. Kelsey relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain the rank of Lieut.; March 17.

The name of Lieut. A. M. L. Nicholson is as now described, and not as stated in *Gazette* of March 9.

The name of Lieut. W. Mainstone is as now described, and not as stated in *Gazette* of Jan. 3, 1919.

Memoranda

(Then follow the names of 12 Probationery Flight-Officers who are granted temp. commns. as Sec. Lieuts., 32 Cadets granted hon. commns., and 355 Canadian Cadets granted hon. commns. as Sec. Lieuts.)

Temp. Hon. Capt. B. S. Cohen relinquishes his commn. on ceasing to be employed; Dec. 31, 1919.

Wing Comdr. W. D. Beatty, C.B.E., A.F.C., O.B.E., is placed on the retired list at his own request, and is permitted to retain his rank; Jan. 1.

HONOURS

IT was announced in a supplement to the *London Gazette* on April 1, that the King has approved of the following rewards being conferred, in recognition of gallantry and distinguished services :—

ROYAL AIR FORCE.

Distinguished Service Order.

Flight Lieut. WALTER FRASER ANDERSON (Pilot); Observer Officer JOHN MITCHELL (Observer), "C" Flight, 47th Squadron. On July 30, 1919, near Cherni Yar (Volga), these officers were pilot and observer respectively, on a D.H. 9 machine, which descended to an altitude of 1,000 ft. to take oblique photographs of the enemy's positions. A second machine of the same flight which followed as escort was completely disabled by machine-gun fire, and forced to land five miles behind the enemy's foremost troops. Parties of hostile cavalry which attempted to capture the pilot and observer of the crashed machine were kept away by the observer's Lewis gun whilst the pilot burnt the machine.

Flight Lieut. Anderson, notwithstanding that his petrol tank had been pierced by a machine-gun bullet, landed alongside the wrecked aeroplane, picked up the pilot and observer, and got safely home. The risk involved in attempting this gallant rescue was very great, as had any accident occurred in landing the fate of all four officers can only be conjectured. The difficult circumstances of the rescue will be fully appreciated when it is remembered that Observer Officer Mitchell had to mount the port plane to stop the holes in the petrol tank with his thumbs for a period of 50 minutes' flying on the return journey.

Flying Officer SYDNEY GILBERT FROGLEY, D.F.C., "A" Detachment (3/R. Berks). A fleet of about 40 Bolshevist vessels, armed with all descriptions of guns, having broken through the defences of the Volunteer Army, commenced a bombardment of Tzaritzin. Flying Officer Frogley led a formation of machines on October 15, 1919, and at a height of 1,000 ft. dropped his bombs with such effect that the fleet was dispersed—several vessels having been destroyed. During a period of four months this officer has rendered invaluable services in South Russia. (The award of Distinguished Flying Cross is also announced in this *Gazette*.)

Flying Officer SAMUEL MARCUS KINKEAD, D.S.C., D.F.C. (late H.L. Inf. and R.N.A.S.), "A" Detachment. On October 12, 1919, near Kotluban, this officer led a formation of Camel machines and attacked the Cavalry Division of Dumenko. By skilful tactics in low flying he dispersed this force, which had turned the left flank of the Caucasian Army, and threatened to jeopardise the whole defence of Tsaritsyn. Flying Officer Kinkead has carried out similar attacks on enemy troops, batteries, camps, and transport with great success and at considerable personal risk. Previous rewards: D.S. Cross, 22.2.18; bar to D.S. Cross, 26.4.18; D.F. Cross, 3.8.18; bar to D.F. Cross, 2.11.18 (201st Squadron, France).

Bar to Distinguished Flying Cross.

Flying Officer WILLIAM ELLIOT, D.F.C., 47th Squadron (R.A.S.C.). On July 30, 1919, whilst on special duty for the Russian Volunteer Army Flying Officer Elliot was shot down about five miles behind the enemy's lines. He then burnt the crashed machine, and kept off the enemy cavalry by machine-gun fire until rescued by another machine which flew to his aid. This gallant and highly skilful pilot has carried out 45 long-distance raids over the enemy lines during a period of four months, and has been continuously on active service since August, 1917, during which period he has taken part in 95 raids and brought down six enemy machines. (D.F.C. gazetted February 8, 1919.)

Distinguished Flying Cross.

Observer Officer ROGER ADDISON, M.C., "A" Detachment (9th E. Lancs. R.). Displayed conspicuous ability on October, 10, 1919, at Tsaritsyn, when about 40 vessels, armed with all kinds of guns, broke through the Volga defences north of the town. He descended on three occasions on that day to very low altitudes, and, dropping his bombs with precision, inflicted heavy casualties on the enemy, although subjected to very fierce fire from them. (Military Cross gazetted June 3, 1918.)

Lieut. EDWARD JOHN CRONIN, "A" Detachment (Nova Scotia Regt.). Has taken part in 80 raids on enemy territory, displaying great ability and gallantry. On July 17, 1919, at Kamyshin (Volga), he carried out an important reconnaissance with great skill and daring, flying as low as 500 ft. at a critical time. Lieut. Cronin previously rendered gallant service during the Bulgarian retreat in the autumn of 1918.

Flying Officer ARTHUR HILTON DAY, "A" Detachment (3rd Cheshire Regt.). At Tsaritzin, on October 10, 1919, when the large flotilla of Bolshevist vessels broke through the Volga defences, he descended to a low altitude, and, by means of bombs and machine-gun fire, materially assisted in the complete rout of the enemy ships which subsequently followed. He has proved a gallant officer in every situation, and was wounded on the occasion above referred to.

Flying Officer SYDNEY GILBERT FROGLEY, "A" Detachment (3rd R. Berks). On July 15, 1919, Flying Officer Frogley led a most successful raid on the Bolshevist flotilla of vessels (about 40 in number) 150 miles from his base, which resulted in the capture of the town of Kamyshin (Volga) by our Allied troops. He then led his formation at almost ground level, attacking the retreating enemy with machine-guns and causing complete disorganisation amongst them. A very risky and noteworthy performance, seeing that the distance back to his base was 150 miles. (The award of the Distinguished Service Order to this officer is also announced in this *Gazette*.)

Flying Officer NORMAN GREENSLADE, M.C., "A" Detachment (10th Devon R.). On August 27, 1919, at Cherni Yar, this officer carried out a raid at a very low altitude on the assembled flotilla of Bolshevist vessels, and by accurate bombing was largely instrumental in the success which followed. The anti-aircraft fire from the enemy was particularly severe during this engagement, and almost all the vessels carried such guns.

Flying Officer JOHN REGINALD HATCHETT, "A" Detachment. On August 27, 1919, at Cherni Yar, assisted in the attack on the Bolshevist fleet with bombs and machine-gun fire, causing great disorder and damage to the vessels and casualties in the *personnel*. Lieut. Hatchett has carried out numerous raids far into the enemy territory, and has always proved a courageous and skilful officer.

Lieut. HOWARD MERCER, M.C., "A" Detachment (Devon. Regt.). On September 23, 1919, at Dubovka, Lieut. Mercer bombed the concentrated Bolshevist flotilla, which were armed with all kinds of guns, including anti-aircraft guns, and then descending to the water level, machine-gunned the *personnel* on four occasions on that day. Lieut. Mercer has always been heedless of danger, and has proved a very gallant officer during the difficult and dangerous operations in South Russia. (Military Cross gazetted July 26, 1917.)

Lieut. HORACE ENFIELD SIMMONS, M.C., "A" Detachment (Welch Regs.). At Chernai Yar, on August 27, 1919, Lieut. Simmons, flying a D.H. 9 carried out work usually assigned to Scout machines. Descending to water level, he attacked a large fleet of enemy vessels, being hotly received by enemy fire from every description of guns. This daring attack created the utmost confusion amongst the Bolshevist troops, who suffered heavy casualties. Lieut. Simmons has always displayed courage and ability of a high order during the operations in South Russia. (Military Cross gazetted March 25, 1917.)

Flying Officer WILLIAM BURNS THOMSON, "A" Detachment. On October 2, 1919, near Katchalinskaya, this officer carried out a daring raid on an enemy battery, in which he descended nearly to the ground and completely destroyed the battery and *personnel* attending it. Flying Officer Thomson has carried out numerous raids far over the enemy lines in the most skilful and courageous manner.

ROYAL AIR FORCE.

Meritorious Service Medal.

14805 Cpl. George Inskip ANDREWS, 313012 Flight Sgt. Percy ARMITAGE, 228135 L.A.C. Maurice Sylvester BEAVER, 156102 A.C. 2 Robert BLOUNT, and 241058 A.C.1 Sydney BOAK (S. Russia); 41007 L.A.C. Davis BUSKIN, 63rd Sqn., and 107075 L. A. C. Sidney Herbert CARTER, 63rd Sqn. (Kurdistan); 109164 Clk. 3 Reginald W. COOK, 295915 A.C. 2 James Albert CRANWELL, and 287026 L.A.C. Francis FALLON (S. Russia); 19370 Sgt. Mech. Ernest Frank GELDART, 63rd Sqn. (Kurdistan); 49891 A.C. 1 George GREEN and 329917, A.C. 2 William HARDY (S. Russia); 54429 Cpl. William HOLLIDAY, 63rd Sqn. (Kurdistan); 204378 S./M. 1 John HOSKINS (S. Russia); 12239 Flight Sgt. George Ernest HOWARD, 52nd Wing (N.W.F., India); 60797 A./M. 1 Thomas HUMPHREY (S. Russia); 407606 A./M. 2 Adam Leslie JAYNES, 114th Sqn. (Afghanistan); 4311 Sgt. William Francis LEWIS 114th Sqn. (N.W.F., India); 404249 Cpl. Ernest MALKIN, 63rd Sqn., and 54019 L.A.C. James MCCARTNEY, 63rd Sqn. (Kurdistan); 7800 Sgt. Frederick Maurice MACDONALD, 31st Sqn. (Afghanistan); 238686 Flight Sergt. Malcolm Frederick George MILL, D.F.M., and 2690 Flight Sgt. Leonard MITCHELL (S. Russia); 19650 Sgt. Edward NORRIS (Kurdistan); 504 Flight Sgt. Frederick William NUNN (S. Russia); 18105 A./C. 1 Ernest OLD, 52nd Wing (N.W.F. India); 126785 A./M. 2 Ned PAMPHILON (S. Russia); 45624 L.A.C.

William PILSBURY, 63rd Sqn. (Kurdistan); 80219 Cpl. Charles Edward SMITH and 66305 Sgt. Frederick John SMITH (S. Russia); 24477 A.C. 1 George Driver THOMPSON, 63rd Sqn. and 33606 Cpl. Henry WHITWORTH, 63rd Sqn. (Kurdistan); 78925 Sgt. Thomas Leonard WISEMAN, 31st Sqn. (Afghanistan); 8437 Cpl./A. Sgt. William WITCHER, 52nd Wing (N.W.F., India).

Foreign Decorations.

THE King has granted unrestricted permission for the wearing of the following decorations, conferred on the officers and other ranks indicated, for valuable services rendered in connection with the great War:—

CONFERRED BY THE PRESIDENT OF THE FRENCH REPUBLIC.

Grand Officier de la Legion d'Honneur.

Lieut.-Gen. Sir David HENDERSON, K.C.B., K.C.V.O., D.S.O. (Colonel, The Highland Light Infantry).

Medaille Militaire

201292 Sergeant Frank LANGSTONE (Observer, 205th Sqn.).

Croix de Guerre, with Silver Star.

6228 Sergeant Cecil PERRY (Motor Driver).

Medaille d'Honneur, with Bronze Swords.

112946 Private Walter GILL (11th Automobile Park).

CONFERRED BY THE KING OF ITALY.

Order of the Crown.

Officer.—Captain James Strachey Thomas Acquinas BARNES, Sqn.-Ldr. Roland James MOUNSEY, O.B.E., Captain Leycester Percy FERRIS-SCOTT.

Chevalier.—Lieut. Wyndham Levy GRECH.

CONFERRED BY THE KING OF THE BELGIANS.

Officer de L'Ordre de la Couronne.

Lieut. William Walker GIBSON, O.B.E.

Chevalier de L'Ordre de la Couronne.

Hon. Major Herbert John CORIN, O.B.E., L.D.S.

Croix de Guerre (Belgian).

Flight Lieut. Philip Fletcher FULLARD, D.S.O., M.C., A.F.C.

CONFERRED BY THE KING OF THE HELLENES.

Order of St. Saveur.

Grand Commander.—Air Vice-Marshal Arthur Vyell VYVYAN, C.B., D.S.O.

Commander.—Wing-Commander Frederick William BOWHILL, C.M.G., D.S.O.; Squadron-Leader Francis Esme Theodore HEWLETT, D.S.O., O.B.E.

The Order of the Redeemer.

Officer.—Wing-Commander Charles Russell Jekyl RANDALL, C.B.E.

Greek Military Cross.

Class 3.—Major Frederick Whittington GAMWELL; Captain Walter James SUSSAN (220th Sqn., Imbros); Flight Lieut. Francis George Maxwell WILLIAMS; Captain Crichton Jordan MILN.

CONFERRED BY THE KING OF RUMANIA.

Order of the Crown.

Officer.—Major the Hon. Edward Alexander STONOR.

Order of the Star of Rumania.

Cavalier.—Major Fernley Turner BRIDGER, late R.A. Force, now 3rd Bn., Royal Highlanders.

CONFERRED BY THE KING OF THE HEJAZ.

Order of the Nahda.

2nd Class.—Air Vice-Marshal Sir William Geoffrey Hanson SALMOND, K.C.M.G., C.B., D.S.O., (Royal Arty.).

3rd Class.—Group-Captain Amyas Eden BORTON, C.M.G., D.S.O., A.F.C. (Roy. Highrs.); Wing-Commander, Richard WILLIAMS, D.S.O., O.B.E. (Aust. Flying Corps).

4th Class.—Lieut. Frederick Cecil HAWLEY, D.F.C. (Aust. Flying Corps); Flight-Lieut. Thomas HENDERSON, M.C. (R.E.); F.O. (A./Flight.-Lieut.) Arthur Dayer MAKINS, D.F.C.; Lieut. Arthur William MURPHY, D.F.C. (Aust. Flying Corps); Lieut. Stanislaus Acton NUNAN (Aust. Flying Corps); Lieut. George Clifton PETERS, D.F.C. (Aust. Flying Corps); Lieut. Victor Donald SIDDONS, D.F.C. (Northts. Regt.); Captain Sir Ross Macpherson SMITH, K.B.E., M.C., D.F.C., A.F.C. (Aust. Flying Corps).

CONFERRED BY THE PRESIDENT OF THE PORTUGUESE REPUBLIC.

Military Medal for Good Service.

113592 A./M. 2 (Actg. Sgt.) Percy GIROD.

CONFERRED BY THE PRESIDENT OF THE REPUBLIC OF PANAMA.

Panamanian War Medal, La Solidaradad Class.

Class 3.—Pilot Officer (Honorary Flying Officer) Franklin Christopher de Lamplugh KIRK (Norfolk Regt.).

Corrections in Description of Officers

The following are the correct descriptions of officers mentioned in Despatches:—

Gazette, No. 31703 of Dec. 22, 1919.—Obs. Officer John Bertram Prouse (N. Russia); P.O. (hon. Flying Officer) Duncan Sinclair (N. Russia); Capt. Edmund Montgomerie Campbell Parker (R.M.), attached Royal Air Force (South Russia).

Gazette, No. 31691, Dec. 16, 1919 (Mentions for Ex-Prisoners of War).—Lieut. Charles Benjamin Bird, M.C. (R.F.A.); Capt. Robert William Nichol.

Award of Military Cross

Gazette, Dec 16, 1919.—Ex-prisoner of War.—Flight-Lieut. Gerald Featherstone Knight (Devon Regt.).

Award of a Bar to Distinguished Flying Cross.—For services in South Russia—*Gazette*, Dec. 22, 1919.—Flying Officer Basil Graham Homfray Keymer, D.F.C.

IT was announced in a Supplement to the *Gazette*, dated March 26, that the King has been graciously pleased to give orders for the following promotions in, and appointments to, the Most Excellent Order of the British Empire for services in connection with the War, to be dated January 1, 1920:—

To be Knights Commanders of the Civil Division of the said Most Excellent Order

Brig.-Gen. WILLIAM ALEXANDER, C.B., C.M.G., D.S.O., T.D.—Director-General of Purchases, Ministry of Munitions, and Controller of Aircraft Supply.

JOSEPH ERNEST PETAVEL, Esq., D.Sc., F.R.S.—Chairman of Aero-Dynamics Sub-Committee of the Advisory Committee on Aeronautics.

Maj.-Gen. RICHARD MATTHEWS RUCK, C.B., C.M.G.—Vice-Chairman of Air Inventions Committee.

Maj. EDWARD HALE TINDAL ATKINSON, R.A.F.—Services in connection with the International Air Convention.

NEVILE GWYN GWYNNE, Esq.—Chairman, Engine Section, Society of British Aircraft Constructors.

ARTHUR JOHN MCCORMACK, Esq., O.B.E.—Managing Director, Wolseley Motors, Ltd.

CHARLES LE MAISTRE, Esq.—Adviser to Aircraft Production Department, Ministry of Munitions.

THOMAS CHARLES WILLIS PULLINGER, Esq., O.B.E.—Managing Director, Messrs. Arrol-Johnston, Ltd.

THOMAS ERNEST STANTON, Esq., D.Sc., F.R.S.—Superintendent, Aero-Dynamical Department, National Physical Laboratory.

GEORGE ALEXANDER SUTHERLAND, Esq., M.D., F.R.C.P.—Valuable services to the Air Ministry.

HAROLD WARING, Esq.—Manager, The Alliance Aeroplane Co., Ltd.

COLIN MARTIN WILLIAMSON, Esq.—Valuable services to the R.A.F. in connection with photography.

REGINALD PAGE CAMPBELL WILSON, Esq.—Assistant Controller, Seaplane Supply, Aircraft Production Department, Ministry of Munitions.

To be Officers of the Civil Division of the said Most Excellent Order

DAVID BALFOUR, Esq.—Chief Drainage Engineer, Department of Works and Buildings, Air Ministry.

JOSEPH GEORGE BEARDMORE, Esq.—Local Director, Messrs. Wm. Beardmore and Co., Ltd.

PETER FREDERICK BLAKER BENNETT, Esq.—Managing Director, Messrs. Thomson-Bennett Magnetos, Ltd.

ROBERT BLACKBURN, Esq.—Managing Director, Blackburn Aeroplane and Motor Co., Ltd.

GRIFFITH BREWER, Esq.—Managing Director, British Wright Co., Ltd.; Lecturer on Aero-Statics and Theory of Flight at Roehampton.

ROBERT ARTHUR BRUCE, Esq.—Director, Westland Aircraft Works.

CHARLES IVOR RAE CAMPBELL, Esq.—Head of Design Section for Rigid and Non-rigid Airships, Airship Production Department, Admiralty.

LIONEL JOHN PORTER FOWLER, Esq.—Assistant Organising Manager, Sopwith Aviation Co., Ltd.

Capt. FREDERICK MICHAEL GREEN.—Aeronautical Engineer, Messrs. Siddeley-Deasy Motor Co., Ltd.

GEORGE HERBERT HENSON, Esq.—Works Manager, Daimler Co., Ltd.

FREDERICK CHARLES LEA, Esq., D.Sc.—Voluntary Research Worker, Aircraft Production Department, Ministry of Munitions; Professor of Civil Engineering, University of Birmingham.

CECIL CHARLES MASON, Esq.—Technical Adviser to Ministry of Munitions; Managing Director, Cambridge Scientific Instrument Co.

WILLIAM RALPH PURNELL, Esq.—Chief Engineer-in-Charge of Administration and control of construction on marine stations, Air Ministry.

ALFRED ARNOLD REMINGTON, Esq,—Chief Designer, Messrs. Wolseley Motors, Ltd.; Inspector of Aeronautical Supplies, Ministry of Munitions.

JOHN EDWARD WYLES, Esq.—Aeroplane Works Manager, Metropolitan Wagon and Finance Co., Ltd.

To be Members of the Civil Division of the said Most Excellent Order.

FRANCIS WILLIAM ARNOTT, Esq.—Aeroplane Works Manager, Daimler Motor Co., Ltd.

ROBERT WILLIAM HARVEY BAILEY, Esq.—Chief Designer, Messrs. Rolls-Royce, Ltd.

ARTHUR GEORGE BALDWIN, Esq.—Chairman, Works Committee, Handley Page Extensions.

ADAM BATHGATE, Esq.—Aircraft Production Department, Ministry of Munitions.

STEWART BAXTER, Esq.—Aircraft Shop Manager, Messrs. Wm. Beardmore and Co., Ltd.

Miss MARY BURNETT.—Services rendered during Air Raids.

KENNETH BURTON, Esq.—Technical Assistant, Aerial Bomb Section, Gun Ammunition Department, Ministry of Munitions; Member, British Military Mission in America.

Flying Officer ALBERT EDWARD BUSH, R.A.F.—Assistant to Chief Engineer, Messrs. Daimler Co., Ltd.

WILFRID GEORGE CARTER, Esq.—Chief Draughtsman, Sopwith Aviation Co., Ltd.

Miss BEATRICE MABEL CAVE-BROWNE-CAVE.—Technical Assistant, Technical Department, Aircraft Production Department, Ministry of Munitions.

Miss ALICE ELEANOR CHASE.—Air Intelligence Department, Air Ministry.

Capt. FRANK ALEXANDER COOKE, D.C.M.—Services in connection with the London Anti-Aircraft Defences.

WILLIAM SAMUEL CROSHER, Esq.—Contracts Branch, Department of Works and Buildings, Air Ministry.

Miss JULIA DAVIES.—For services rendered during Air Raids.

ALBERT ALFRED DAVIS, Esq.—Department of Works and Buildings, Air Ministry.

ALFRED HUBERT ROY FEDDEN, Esq.—Chief Engineer and Director, Messrs. Brazil, Straker and Co., Ltd.

HENRY PHILLIP FOLLAND, Esq.—Chief Engineer and Designer, Nieuport and General Aircraft Co., Ltd.

Miss JOSÉMÉE MARGUERITE GREENWOOD.—Aircraft Production Department, Ministry of Munitions.

KENELM EDWARD LEE GUINNESS, Esq.—Manager, Robinhood Engineering Works, Ltd.

Miss LILIAN HITCH.—Woman Staff Officer, Supply Department, Aircraft Production Department, Ministry of Munitions.

ERNEST WALTER HIVES, Esq.—Experimental Engineer, Messrs. Rolls-Royce, Ltd.

Mrs. DE COURCY IRELAND MYRTLE.—Personal Assistant to Deputy Chief of the Air Staff.

Mrs. LENORE SYBIL JENNENS.—Assistant Inspector, Aeronautical Inspection Department, Ministry of Munitions; Superintendent, Training Classes for Women Clerical Staff, Aircraft Production Department, Ministry of Munitions.

REGINALD KERSHAW PIERSON, Esq.—Chief Designer, Aviation Branch, Messrs. Vickers, Ltd.

ARTHUR GEORGE PITT, Esq.—Chief Designer in charge of Drawing Office, Royal Aircraft Establishment, Farnborough.

Mrs. GLADYS HOWARD ROUQUETTE.—Women Staff Officer, Supply Department, Aircraft Production, Ministry of Munitions.

ARTHUR JOHN ROWLEDGE, Esq.—Chief Designer, Messrs. D. Napier and Son, Ltd.

Miss MARY CONSTANCE SHEPPARD.—Woman Staff Officer, Aircraft Production Department, Ministry of Munitions.

Mrs. EDITH MABEL SMITH.—Supply Department, Aircraft Production Department, Ministry of Munitions.

Miss MABEL ROUSE-SMITH.—Woman Staff Officer, Aircraft Production Department, Ministry of Munitions.

Mrs. IVY MADGE WILSON.—Aircraft Production Department, Ministry of Munitions.

JAMES ROBERT SPENCER YOUNG, Esq.—Administrative Assistant, Secretary's Department, Air Ministry.

FLIGHT

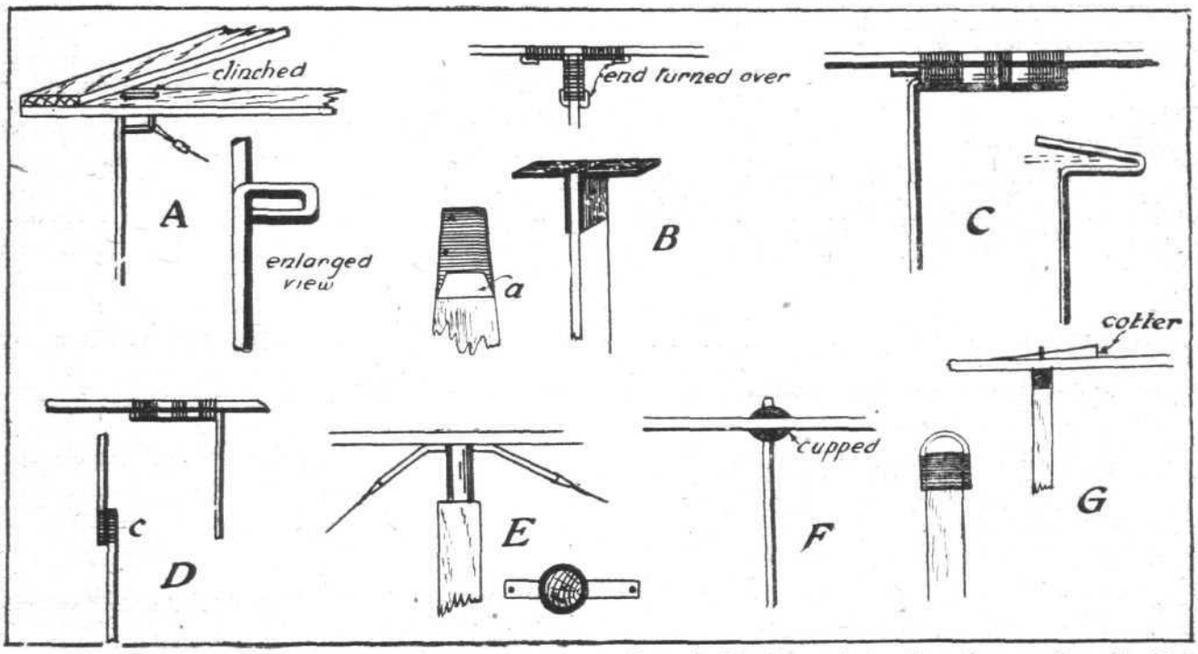
NOTE.—*All communications should be addressed to the Model Editor.*

Inter-Strut Attachments for Model Biplanes

FOR the wing inter-struts of model biplanes I do not think anything more suitable than hard-drawn brass wire could be used. It is sufficiently rigid to fulfil its purpose, and at the same time yields should the wing tip come into contact with a wall, tree, etc., during flight. A combined inter-strut and bracing eye made from this material is shown in the illustration (*see* A). It is made by pulling the wire round a piece of iron rod filed to a suitable cross section and which should be secured in the vice. The top portion should be formed squarely to the stanchion, so that it beds home parallel to the wing spar. The end of the strut is forced through the wing spar and bent down flush to it, and should bind with sufficient friction to prevent the strut from swivelling. The truss bracing passes through the eye, and is secured by having its end turned back over a small ferrule cut from by-pass tubing as indicated in the enlarged detail.

Where wood is used for inter-struts it is usual to utilise fishplates to affix them to the spar. A portion of the fishplate (*see* B) must be left unbound, as at *a*, for the purpose of turning it back over the binding to prevent it pulling through the latter. A further sketch illustrates the fishplate joint in perspective, and the strut in place; either birch or hickory should be used for the inter-struts. If cross-bracing is used it would not be necessary to turn the plates back over the binding of that portion which engages with the strut, as the bottom of them can be conveniently drilled to provide an anchorage for the bracing. At C and D is shown an inter-strut fixing for wire planes; C indicates that a brass socket is soldered to the wire-edge of the 'plane. It receives a strut, shaped on the ends as at *b*, which is sprung into the tubular socket, when the position of the wire is as shown by the dotted line. This forms an easily detachable method of fixing the strut. Alternatively, if the struts are required to be permanently fixed, this could be effected as shown by D. Here each strut is made in two pieces, each an eighth of an inch longer than half the desired gap. Each half is bound and soldered to the wing *before* the latter is covered; they are finally brought together, bound, and soldered as given by *c*.

The strut socket shown by E is suitable for larger models; a piece of tube is cut, filed and bent to the shape indicated, two pins well clinched securing it to the wing spar, and the inter-strut being held in place by the tension on the bracing, the strut will, of course, require to be of round cross-section where it fits the socket; the other portion should be of ichthyoid or streamline form. At F is shown another method of securing wire stanchions or inter-struts to wooden wings. A copper washer is soldered to the stanchion on each side of the wing spar. The bracing passes round the stanchion between the washer and the wing.



Another neat strut attachment is given by G. Loops of wire are bound to each end of the strut, and these fit into slots cut in the wing spars. The struts are locked in position by the cotter shown in the drawing. Owing to the weakening of the spars resulting upon slotting them, this detail is only applicable to large models.

Reply to Correspondents

The ratio of length of machine to span should be in the neighbourhood of 2–3 for canard machine. The loading should not exceed 8 ozs. per sq. ft.

A Japanese Commission in England

The Japanese Commission which is doing the round of the world's chief aircraft constructional centres in order to study modern machines in the greatest detail is now in England. The Commission which comprises Lieut.-Gen. Nagaoka, Maj.-Gen. Matsuo Itami, Major Oyaizu and Capt. Sano, and is accompanied by Mr. Bunshiro Suzuki who is special correspondent for some of the leading Japanese journals, after inspecting the activities of the Avro Company at Southampton on the morning of March 29, were conveyed to Bristol in a couple of Avro machines, including the new triplane type. At Bristol they were able to make a full inspection of the "Bristol" aircraft and of the works of the Bristol Aeroplane Co., Ltd., and they enjoyed a flight in the large and luxurious four-engined "Bristol" Pullman. Their visit proved a revelation as to British aerial development, and the machines of all types exhibited to them aroused the keenest interest. The Commission have been highly impressed with the present day position of British construction, and the spirit of co-operation existing within the industry itself has not escaped comment.

A Rescue Rewarded

AT Portsmouth on March 31, the Mayor presented a silver cup, awarded by the Air Council, to Capt. John Williams, master of the steamship *Camber*, for rescuing the pilot of a seaplane which fell into the water near Stokes Bay, through engine trouble.

SIDEWINDS

A REMARKABLY animated scene was witnessed the other evening in Oxshott Woods, Surrey, when a large assemblage of cars of all types was brought together by Messrs. C. A. Vandervell and Co., Ltd., the well-known electrical engineers of Acton, to test a variety of anti-dazzle devices, both British and foreign. Numerous photometric tests were taken, and the figures when worked out should prove most interesting and instructive, as well as the criticisms of those present, amongst whom were Superintendent Bassom, chief of the Traffic Department, New Scotland Yard, and Mr. Gerard of the Ministry of Transport, who perhaps for the first time were given the opportunity of seeing the various schemes put forward, one against the other, under identical conditions. The tests were carried out under the supervision of Mr. D. Elyard Brown of Messrs. Vandervell's.

MESSRS. C. A. VANDERVELL AND CO., LTD., of Acton, the well-known electrical engineers, have been granted the Warrant of Appointment as Manufacturers of Electrical Equipment for Motor-Cars to His Majesty the King, with authority to use the Royal Arms.

"THE cylinders are for the launch of the s.y. *Elettra*, which belongs to Mr. Marconi, and the latter is anxious to sail shortly to carry out wireless experiments at sea." Such, in brief, was the information contained in a letter to Barimar, Ltd., scientific welding engineers, relative to the repair of certain cylinders urgently wanted by the great scientist who has revealed to the world the wonders of wireless telegraphy. Barimar experts at once got busy, re-created the damaged cylinders, and within three days of the receipt of the letter the cylinders were on their way to the southern seaport off which the vessel was lying. The *Elettra*, a 700-ton craft, flying the Italian flag, is fitted with a powerful wireless installation by means of which Mr. Marconi is to try and determine something of the nature and meaning of the "mystery messages" that have for many weeks been puzzling scientists. The vessel is now all but ready to leave Southampton, where she has been fitted by Messrs. Camper and Nicholson.

A FURTHER step in the arrangement of a practicable flying route from Cairo to the Cape is marked by the decision of Messrs. Rolls-Royce, Ltd., to dispatch an expert aeroplane mechanic to Cairo, to remain there in order to give advice and assistance to airmen landing at that centre. The engineer, who is also an experienced airman, will probably leave to take up his appointment in about a fortnight's time. The firm, it is explained, have no immediate policy of investigating geographical or meteorological conditions concerning the Transcontinental flight. The intention is to provide the means of mechanical help when needed.

Air Law Offences

AT Bletchley Sessions, on April 1, the By Air Co., Coventry, was fined £10 on each of five charges for offences under the Air Navigation Act, and Claud Gerald Mollen Le Champion, pilot, was fined £5 on each of six charges, *i.e.*, 1. Flying a machine not carrying British markings; 2. Flying a machine not certified as airworthy; 3. Flying machine not inspected on day of flight; 4. Taking passengers up for hire or reward on a machine not licensed for this purpose; 5. Not carrying license on machine; 6. Flying without being licensed. The case was the first in England under the Air Navigation Act.

Police-Inspector Calloway said that the machine referred to was on its way from London to Coventry. It came down at Bletchley on account of engine trouble, and after it had been overhauled the pilot, "in order to pay his hotel expenses," decided to give some local flights. This he did, and one of the charges, in addition to those concerning the markings of the aeroplane, concerned the non-inspection of the machine before flight.

Capt. Pearson, assistant to the licensor of aeroplanes and aerodromes, gave evidence as to Le Champion's military record as a flying officer. The defendant, he said, had been in the Royal Air Force and had been transferred to the infantry. He held an "A" certificate, which allowed him to fly, but not to carry goods or passengers for hire or reward.

PUBLICATIONS RECEIVED

Report No. 55. Investigation of the Muffling Problem for Airplane Engines. National Advisory Committee for Aeronautics, 2722 Navy Building, Washington, D.C., U.S.A.

Report No. 75. The Aerodynamic Properties of Thick Aerofoils Suitable for Internal Bracing. National Advisory Committee for Aeronautics, 2722 Navy Building, Washington, D.C., U.S.A.

COMPANY MATTERS

Rolls-Royce, Ltd.

THE directors announce that after paying or providing for all trade expenses, suitable depreciation of buildings, machinery and plant, and after charging repairs and replacements to revenue, the trading for the year to October 31 last, resulted in a net profit of £192,778, after making provision for estimated excess profit tax. The dividend, which was at the rate of 15 per cent. for such period, has already been paid. The balance-sheet takes no account of the manufacture for War purposes in the United States of America, which was financed by the Government.

Sunbeam Motor Car Co., Ltd.

THE directors of the Sunbeam Motor Car Co., Ltd., have declared an interim dividend of 5 per cent., free of tax, on the ordinary shares payable April 15 next, when the half year's preference dividend is also payable.

Vickers, Ltd.

THE directors of Vickers, Ltd., have declared a final dividend of 1*s.* 3*d.* per share, or 6¼ per cent., on the ordinary shares, making 2*s.* 3*d.* per share, or 11¼ per cent., for the year, free of tax up to 6*s.* in the £.

NEW COMPANIES REGISTERED

BREWERS WHARF AND CARTAGE, LTD., 8, Leadenhall Street, E.C.—Capital £4,000, in £1 shares. Proprietors or hirers of aeroplanes and airships, cars, general carriers, etc. First directors: J. W. Molden, A. C. Dawson, P. E. Dawson, W. E. Spearing, C. E. Stanfield, and W. E. Woodfield.

POTTERIES AERIAL TRANSPORT CO., LTD., 8, Catherine Street, Longton.—Capital £1,500, in £1 shares. Aeroplane and automobile manufacturers, aerodrome proprietors, etc. First directors: H. Birchall and C. J. Clark.

SCOTTISH AERIAL TOURING AND TRANSPORTATION CO., LTD., 143, Princes Street, Edinburgh (Registered in Edinburgh).—Capital £5,000, in £1 shares. First directors A. McCredie, A. A. Mitchell and H. M White.

AERONAUTICAL PATENTS PUBLISHED

Abbreviations:—cyl. = cylinder; I.C. = internal combustion; m. = motors.

APPLIED FOR IN 1918

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published April 1, 1920.

4,732. F. H. PAGE. Struts, spars, etc. (139,527.)

Published April 8, 1920.

20,455. F. F. SIMONS. Aircraft propulsion. (139,839.)

APPLIED FOR IN 1919

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published April 1, 1920.

1,475. J. W. RAPP. Knock-down construction for aeroplane wings. (122,650.)

3,074. W. E. GRANT. Inclinometers. (139,572.)

7,519. E. M. PARRY. Rotary motors. (139,638.)

9,900. J. G. PARSONS. Propulsion and steering of aerial vessels. (139,668.

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